| | | |
|---|---|---|
| Docket: | : | A.20-07-012 |
| Exhibit Number | : | Cal Advocates - ____ |
| Commissioner | : | Genevieve Shiroma |
| Administrative Law Judge | : | Charles Ferguson |
| Public Advocates Office Witness | : | Anthony Andrade |


# REPORT AND RECOMMENDATIONS ON REGION 3 PLANT, CONTINGENCY, AND PLANT ESCALATION

## Application 20-07-012

**San Francisco, California**
**February 16, 2021**

# MEMORANDUM

The Public Advocates Office at the California Public Utilities Commission ("Cal Advocates") examined requests and data presented by Golden State Water Company ("GSWC") in Application ("A.") 20-07-012 ("Application") to provide the California Public Utilities Commission ("Commission") with recommendations that represent the interests of ratepayers for safe and reliable service at the lowest cost. This Report is prepared by Anthony Andrade. Eileen Odell is Cal Advocates' project lead for this proceeding. Victor Chan is the oversight supervisor and Shanna Foley and Jamie Ormond are legal counsel.

Although every effort was made to comprehensively review, analyze, and provide the Commission with recommendations on each ratemaking and policy aspect of the requests presented in the Application, the absence from Cal Advocates' testimony of any particular issue does not constitute its endorsement or acceptance of the underlying request, or of the methodology or policy position supporting the request.

# TABLE OF CONTENTS

# EXECUTIVE SUMMARY

## I. Introduction

This report provides Cal Advocates' analysis and recommendations for GSWC's plant contingency and escalation factors, Region III capital additions, and non-revenue water adjustment due to Neutral Output Discharge Elimination System ("NO-DES") flushing.

Cal Advocates' recommendations for plant contingency and escalation factors impact the capital additions in Regions I and II, construction work-in-progress ("CWIP"), and pipeline replacement company-wide. The recommended capital budget resulting from Cal Advocates' contingency and escalation factors adjustments to Region I and II's capital additions, CWIP, and pipeline replacement appear in those reports.

Cal Advocates' recommended non-revenue water adjustment due to NO-DES flushing impacts Region II and Region III. Cal Advocates' Report and Recommendations on District Operations & Maintenance Expenses and Supply Expenses, states the expected savings from GSWC's implementation of NO-DES flushing.[1] Cal Advocates calculates the non-revenue water adjustment according to the procedure in this testimony's Attachment 2-5.

## II. Summary of Recommendations

The table below summarizes GSWC's and Cal Advocates' recommended Region III capital budgets for non-pipeline projects by year.

[1] Cal Advocates Report and Recommendations on District Operations & Maintenance Expenses and Supply Expenses, pp. 19-20.

**Table ES-1: Non-Pipeline Capital Budget – Region III**

| | (A) Description | (B) 2021 | (C) 2022 | (D) 2023 | (E) Total |
|---|---|---|---|---|---|
| 1 | GSWC | $12,465,900 | $34,399,500 | $25,710,900 | $72,576,300 |
| 2 | Cal Advocates | $11,571,900 | $25,344,000 | $10,570,200 | $47,486,100 |
| 3 | GSWC > Cal Advocates | $894,000 | $9,055,500 | $15,140,700 | $25,090,200 |
| 4 | Cal Advocates as % of GSWC | 93% | 74% | 41% | 65% |

The Commission should adjust GSWC's estimated capital budget for non-pipeline projects in Region III according to the adjustments below.

A. Chapter 1: Contingency & Escalation Factors

The Commission should:

- Adjust GSWC's contingency factors to a uniform 5% for all capital projects, pipeline, and blankets, including all projects that are in CWIP accounts, consistent with the Commission's previous holdings for GSWC's contingency.
- Suspend GSWC's direct cost escalation in 2021, 2022, and 2023 because of the economic downturn caused by the COVID-19 pandemic.

B. Chapter 2: Los Alamitos CSA

The Commission should:

- Deny funding in rates for the Ball Plant Land Acquisition and the Ball Plant Iron and Manganese Removal System because Ball Well No. 1 has low levels of manganese and more cost-effective alternatives exist.

C. Chapter 3: Placentia CSA

The Commission should:

- Adjust funding in rates for the Clearview Reservoir Replacements because a single-reservoir design is more cost-effective.
- Adjust funding for the Concerto Booster Pump upgrade project because a pump building is not needed.

- Deny funding for the Fairmont Oak Meadow pressure regulating valve ("PRV") project because it is not necessary to relocate the PRV to improve safety.

D. Chapter 4: Claremont CSA

The Commission should:

- Adjust funding in rates for the Del Monte Booster Pump Station ("BPS") Replacement because GSWC should retrofit the pump building instead of replacing it.
- Adjust funding for the Indian Hill North BPS Replacement because a pump building is not needed.

E. Chapter 6: San Gabriel Valley CSA

The Commission should:

- Deny funding in rates for the new Saxon 0.75 MG Reservoir and BPS because the South San Gabriel system has enough water supply to meet its demands without a new reservoir.
- Deny funding for the new Encinita Field Office because the existing Saxon Field Office does not need to be demolished.
- Deny funding for the Jeffries 1.25 MG Reservoir, BPS, and fencing because the South Arcadia system has enough water supply to meet its demands without a new reservoir.

F. Chapter 7: Barstow CSA

The Commission should:

- Adjust funding in rates for the Bear Valley Plant Phase 3 because a new pump building is not needed.
- Adjust funding for the Supervisory Control and Data Acquisition ("SCADA") consistent with GSWC's revised project cost estimates.

G. Chapter 9: Morongo Valley CSA

The Commission should:

- Deny funding in rates for Highway Uranium Treatment Plant because the Morongo Del Norte system already has reliable water supply.

# CHAPTER 1: CONTINGENCY & ESCALATION FACTORS

## I. Introduction

This chapter provides Cal Advocates' recommendations for contingency and escalation factors that impact capital budgets companywide. While this chapter contains the common analysis for contingency and escalation factors recommendations, the resulting numerical adjustments appear in each customer service area ("CSA") chapter.

GSWC has historically added an amount to capital budgets for "contingency." GSWC can use the contingency budget to fund unexpected capital expenditures. GSWC determines its contingency budget by multiplying each project's cost estimate by a factor. GSWC then adds the resulting contingency amount to the project's cost estimate. Both GSWC and Cal Advocates express the contingency factor as a percentage of the base project costs. When parties in GSWC's general rate cases ("GRCs") have litigated the issue of contingency, the Commission has decided to apply a 5% contingency factor since 2006.[2]

GSWC has also historically used escalation factors to estimate the cost of projects in future years. In its current application, GSWC bases all project cost estimates on 2019 dollars. To budget for test years in 2022 and 2023, GSWC escalates the 2019 estimates to future values by multiplying them by escalation factors. Since anticipated cost escalation differs between construction costs and company direct costs such as permitting and design, GSWC applies two different sets of escalation factors. Cal Advocates provides recommendations for the set of escalation factors that GSWC applies to direct costs.

As an example, the following table shows how GSWC applies escalation and contingency factors to a typical project cost estimate.[3]

[2] The Commission applied a 5% contingency factor for GSWC's Region III in Decision ("D.") 06-01-025 and Region I in D.08-01-043. The Commission applied a companywide 5% contingency factor in D.16-12-067.
[3] This example is based on the Brine Waste Feasibility Study (Phase 1) that GSWC plans for 2021.

**Table 1-1: Example of GSWC Capital Project Cost Estimate**

| | (A) Step | (B) Estimate | (C) Calculation | (D) Result |
|---|---|---|---|---|
| 1 | A | Construction Cost | \$180,000 | \$180,000 |
| 2 | B = 0.15 × A | Direct Cost | 0.15 × (\$180,000) | \$27,000 |
| 3 | C = $(1.015)^2$ × A | Construction Cost with Escalation[4] | $(1.015)^2$ × (\$180,000) | \$185,441 |
| 4 | D = 1.037 × B | Direct Cost with Escalation | 1.037 × (\$27,000) | \$27,999 |
| 5 | E = C + D | Subtotal | \$185,441 + \$27,999 | \$213,440 |
| 6 | F = 0.1424 × E | Overhead at 14.24% | 0.1424 × (\$213,440) | \$30,394 |
| 7 | G = 0.10 × (E + F) | Contingency at 10% | 0.10 × (\$213,440 + \$30,394) | \$24,383 |
| 8 | H = E + F + G | **Total** | \$213,440 + \$30,394 + \$24,383 | **\$268,217** |

## II. Summary of Recommendations

- The Commission should adjust GSWC's contingency factors to a uniform 5% for all capital projects, pipeline, and blankets, including all projects that are in CWIP accounts, consistent with the Commission's previous holdings for GSWC's contingency.
- The Commission should suspend direct cost escalation in 2021, 2022, and 2023 because of the economic downturn caused by the COVID-19 pandemic.

## III. Discussion

### A. Contingency Factors

The Commission should adjust GSWC's contingency factors to a uniform 5% for all capital projects, pipeline, and blankets, including all projects that are in CWIP

[4] Assumes construction cost escalation of 1.5% per year for two years.

accounts because GSWC does not provide sufficient justification to deviate from prior Commission decisions regarding GSWC's contingency factor.

In its Application, GSWC doubles the contingency factor that it uses in "non-pipeline" project estimates. GSWC uses a 5% contingency factor for pipeline projects and blankets but uses a 10% factor for non-pipeline projects.[5] Non-pipeline projects include wells, reservoirs, booster pump stations, and various site improvements. GSWC's increased 10% contingency factor, therefore, contributes to its request for authorization to raise rates.

The Commission has previously and repeatedly rejected GSWC's use of a 10% contingency factor.[6] The Commission chose a uniform 5% contingency factor over GSWC's proposed 10% in GSWC's 2005 and 2007 GRCs. In explaining why a 10% contingency was unnecessary, the Commission found that:

> [A contingency budget] is used for funding unexpected capital expenditures or to fund unforeseen cost overruns of budgeted projects. A critical management function includes accurately budgeting and pursuing cost containment.[7]

The Commission chose the 5% factor after considering the critical management function of accurately budgeting and pursuing cost containment.[8] Additionally, the Commission stated that "under [GSWC]'s proposal, budget overruns are indirectly sanctioned."[9]

The Commission affirmed the use of a 5% contingency factor in GSWC's 2014 GRC.[10] In its decision, the Commission clearly provided its reasons for supporting a uniform 5% factor. The Commission stated that:

- GSWC's capital projects are presented with sufficient detail.

---

[5] GSWC Hanford and Insco Testimony, p. 17, lines 3-5.
[6] D.06-01-025, pp. 38-39; D.08-01-043, p. 34; and D.16-12-067, p. 146, Conclusion of Law ("COL") 6.
[7] D.08-01-043, p. 69, Finding of Fact ("FOF") 24.
[8] D.08-01-043, p. 34.
https://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/78344.PDF#p.=37.
[9] D.08-01-043, p. 34.
[10] D.16-12-067, p. 146, COL 6.

- Most projects are projects that have been conducted before or are to replace or improve facilities.
- GSWC relies on expert recommendations in preparing its capital forecast.
- Many projects have design components where a project can be fully scrutinized and studied prior to construction.

Based on these reasons, the Commission stated that:

> …a five percent contingency factor for capital projects is reasonable and should be applied. This five percent contingency factor should be applicable to both capital projects and blanket budgets.[11]

In the 2014 GRC decision, the Commission acknowledged GSWC's arguments including the assertion that a 10% factor is consistent with industry standards and accounts for the uncertainty of project costs.[12] The Commission nevertheless judged that these arguments were "insufficient reason to justify deviating from the Commission's past decisions."[13]

In summary, the Commission's past decisions rejected GSWC's proposed 10% contingency factor. In doing so, the Commission clearly established reasoning applicable to contingency factors.

The Commission should apply the reasoning it established in past GSWC GRC decisions to GSWC's current application. The Commission has already reviewed most of the information and arguments in GSWC's contingency discussion. GSWC's current application includes:

- the Association for the Advancement of Cost Engineering's 1995 report on contingency,
- the declaration that a contingency budget is not a 'slush fund,'
- the relationship between risk, probability, and contingency,
- the difference between contingency and cost overruns, and

[11] D.16-12-067, p. 46. https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M171/K508/171508968.pdf#p.=56.
[12] D.16-12-067, p. 45.
[13] D.16-12-067, p. 46.

- the assertion that its contingency factors are standard practice within the industry.[14]

GSWC made these same arguments in its 2014 GRC.[15] The Commission acknowledged the arguments, demonstrating that the Commission considered them, but rejected that they justified deviating from past decisions.[16] In contrast, GSWC's current application does not acknowledge the Commission's past decisions on the issue of GSWC's contingency. GSWC's application therefore makes no attempt to argue that the Commission's past decisions on this same issue were erroneous. The Commission should therefore judge that all these arguments are still "insufficient reason to justify deviating from the Commission's past decisions."[17]

Besides the arguments that the Commission has previously heard and rejected, GSWC's remaining claim is that "non-pipeline projects have a lower risk tolerance requiring a greater amount of contingency."[18] GSWC maintains a 5% contingency factor for pipeline and blankets but doubles the non-pipeline projects' factor to 10%.

GSWC's claim that non-pipeline projects require a greater amount of contingency, however, is also inconsistent with the Commission's decision in GSWC's 2014 GRC. The Commission previously concluded that a 5% contingency factor is reasonable for <u>both</u> capital projects and blankets.[19]

The Commission's reasons for concluding that a 5% factor is reasonable for capital projects are still true for the current GRC. First, GSWC's capital projects are presented with sufficient detail. GSWC's presentation of capital projects in the current application include over 100 non-pipeline project cost estimates ("PCEs") with itemized cost breakdowns.[20] For example, GSWC created the PCE for its planned project at Bear

---

[14] GSWC Prepared Testimony of Robert Hanford and Mark Insco (hereinafter GSWC Hanford and Insco Testimony), p. 15, line 13 to p. 17, line 8.
[15] Attachment 1-2, A.14-07-006, GSWC Prepared Testimony of Robert McVicker and Mark Insco, p. 14, line 18 to p. 16, line 13.
[16] D.16-12-067, p. 45.
[17] D.16-12-067, p. 46.
[18] GSWC Hanford and Insco Testimony, p. 17, lines 4-5.
[19] D.16-12-067, p. 146, COL 6.
[20] GSWC Rate Base Workpapers, Capital, "PCEs" files.

Valley Plant with sixteen items, ranging from the construction of a 1,200 square foot building to the disposal of existing electrical panels.[21]

Second, most projects are projects that have been conducted before or are to replace or improve facilities. Most capital projects included in the current application are to replace existing pipeline, wells, reservoirs, booster stations or to improve sites with new buildings, fencing, grading, electrical equipment, Supervisory Control and Data Acquisition ("SCADA") upgrades, or seismic retrofits.

Third, GSWC also relies on expert recommendations in preparing its capital forecast. The Commission can see GSWC's use of expert recommendations in capital projects such as the SCADA upgrades or the project at the Holabird Plant. GSWC retained Cannon Engineering Consultants to create a SCADA Master Plan that both identifies sites for upgrades and estimates the upgrade costs.[22] For the Holabird Plant, GSWC relies on recommendations from WesTech's Field Service Trip Report.[23] This report states that WesTech representatives could help GSWC determine the equipment needed at the Holabird Plant.[24]

Fourth, many projects have design components where a project can be fully scrutinized and studied prior to construction. GSWC refers to projects with a two- or three-year planning schedule in its current application. For these projects, GSWC schedules design costs in the first year and construction costs in the remaining years.[25] Projects' design components, therefore, can be studied before completion. This is especially true for projects that GSWC has already designed and currently treats as CWIP. GSWC, however, applies a contingency factor greater than 5% to many CWIP projects.[26]

---

[21] GSWC Rate Base Workpapers, Capital, PCE_RIII – Barstow (Bear Valley Phase 3).xlsx, tab "Construction Cost."

[22] GSWC Prepared Testimony of Patrick Kubiak, Volume 1 of 2, p. 55, lines 12-17, and p. 66, lines 4-7.

[23] GSWC Hanford and Insco Testimony, p. 278, lines 7-10.

[24] GSWC Hanford and Insco Testimony, Volume 8 of 10, Attachment CA02, p. 3.

[25] GSWC Hanford and Insco Testimony, p. 15, lines 7-11.

[26] GSWC Prepared Testimony of Elizabeth V. McDonough and Dane T. Sinagra, Volume 1 of 3, Attachment F, pp. 1, 18, 20, 22, and 26; Attachment G, pp. 14, 18, and 20; and Attachment H, pp. 1-3, 10, 37, 43, 45, 47, 68, 82, 86, and 90-94.

Based on the reasons above, the Commission should adjust GSWC's contingency factors to a uniform 5% for all capital projects and blankets, including all projects that are in CWIP accounts. This adjustment would be consistent with the Commission's past decisions in GSWC GRCs.

B. Company Direct Cost Escalation Factors

The Commission should suspend direct cost escalation in 2021, 2022, and 2023 because of the economic downturn caused by the COVID-19 pandemic.

In its application, GSWC uses direct cost escalation factors of 3.7% for 2021, 4.1% for 2022, and 4.3% for 2023.[27] GSWC based this set of escalation factors on the Public Advocates Office's February 11, 2020 Memo on Compensation Per Hour. In these monthly memos, Cal Advocates provides the Commission's water industry staff with historical and forecasted annual changes in compensation per hour. Cal Advocates' monthly compensation memos are based on data from a private economic forecasting organization, IHS Global Insight.[28] GSWC escalates direct costs for capital projects' design and permitting according to factors from a Cal Advocates compensation memo to account for labor cost inflation.

As discussed in Cal Advocates' Report and Recommendations on GSWC District A&G Expenses, District Labor Expenses, Conservation Expenses and Special Request 4, the Commission should recognize that the United States has been coping with an economic downturn caused by the COVID-19 pandemic. As of September 2020, California's unemployment rate stands at 11.0% (compared to 4.0% in September 2019).[29] According to survey data from TransUnion, approximately 52% of Americans have stated that they are being financially impacted by the COVID-19 pandemic and 75%

---

[27] GSWC Prepared Testimony of Jon Pierotti, p. 2, lines 26-28 and p. 3, lines 24-25.
[28] Attachment 1-3, GSWC Response to Public Advocates Data Request AA9-008, Attachment AA9-008 Q.1. Note that IHS Global Insight is now "Economics and Country Risk from IHS Markit." https://ihsmarkit.com/btp/global-insight-economics-country-risk.html.
[29] State of California's Employee Development Department.

of those surveyed are worried about paying their utility bills.[30] The State of California has taken extraordinary measures in recognition of the economic hardships its citizens now face, including passage of mortgage protections and a moratorium on evictions through February 1, 2021,[31] preventing utility disconnections for non-payment,[32] and preventing COVID-19 relief from being garnished by debt collectors.[33] During this "COVID-19 recession," the State and state worker unions agreed to two furlough days per month in exchange for a 9.23% pay reduction.[34] For these reasons, Cal Advocates explains that funding labor expense increases due to inflation would be unreasonable.[35]

GSWC's direct cost escalation factors are unreasonable because they fail to account for the economic downturn caused by the COVID-19 pandemic. During this COVID-19 recession, the Commission should not authorize funding for increases in labor expenses due to inflation. Since GSWC will not need to increase direct costs to account for its employees' labor inflation, the Commission should suspend direct cost escalation in 2021-2023 for projects that are designed by GSWC's employees "in-house."

Depending on the project, GSWC will pay direct costs for in-house labor or for outside labor by design firms.[36] GSWC decides to hire an outside firm for design work when a project's base construction costs exceed $500,000. For these projects, GSWC assumes direct costs will be 20% greater than for projects designed in-house.[37]

The Commission should also eliminate direct cost escalation for projects that are designed by outside firms because GSWC has an existing 20% adjustment to estimate higher direct costs for these projects. Although it escalates estimates for direct costs using factors from February 11, 2020, GSWC's application elsewhere uses factors from

---

[30] https://content.transunion.com/v/financial-hardship-report-us-wave-twelve
[31] AB 3088, signed by Governor Newsom on Aug. 31, 2020.
[32] See California Executive Order N-42-20.
[33] Executive Order N-57-20.
[34] Side Letter of Agreement between Service Employees International Union, Local 1000 and the State of California, filed on June 19, 2020.
[35] Cal Advocates Report and Recommendations on GSWC District A&G Expenses, District Labor Expenses, Conservation Expenses and Special Request 4, pp. 11-14.
[36] GSWC Hanford and Insco Testimony, p. 6, lines 20-23.
[37] GSWC Hanford and Insco Testimony, Volume 1 of 10, Attachment 5, p. 1.

the later Public Advocates Office's June 1, 2020 Memo on Compensation Per Hour.[38] The factors from this later memo are 1.4% in 2021, -0.4% in 2022, and 0.4% in 2023. Since Cal Advocates based the June 1, 2020 factors on an economic outlook during the pandemic, these factors better represent anticipated increases in outside firms' direct costs than those from the February 2020 memo. Over three years, these factors represent a net 1.4% increase over GSWC's base direct cost estimates.[39] GSWC's assumption of 20% greater direct costs for projects designed by outside firms should therefore be enough to absorb the smaller 1.4% escalation.

## IV. Conclusion

Based on the reasons above, the Commission should adjust GSWC's contingency and direct cost escalation factors. Specifically, the Commission should:

- Adjust GSWC's contingency factors to a uniform 5% for all capital projects, pipeline, and blankets, including all projects that are in CWIP accounts, consistent with the Commission's previous holdings for GSWC's contingency.
- Suspend GSWC's direct cost escalation in 2021, 2022, and 2023 because of the economic downturn caused by the COVID-19 pandemic.

[38] GSWC Prepared Testimony of Nanci Tran, p. 19, lines 27-28 and GSWC O&M and A&G Expenses Workpapers, p. 105.

[39] $[(1 + 0.014) \times (1 - 0.004) \times (1 + 0.004) - 1] \times 100\% = 1.4\%$.

# CHAPTER 2: LOS ALAMITOS CSA

## I. Introduction

This chapter provides Cal Advocates' recommended adjustments to GSWC's non-pipeline capital projects for the Los Alamitos CSA. The Los Alamitos CSA is composed of the West Orange County system.

## II. Summary of Recommendations

The table below summarizes GSWC's and Cal Advocates' recommended capital budgets for non-pipeline projects by year.

**Table 2-1: Non-Pipeline Capital Budget – Los Alamitos CSA**

| | (A) Description | (B) 2021 | (C) 2022 | (D) 2023 |
|---|---|---|---|---|
| 1 | GSWC | $169,900 | $1,004,500 | $4,844,800 |
| 2 | Cal Advocates | $161,400 | $949,300 | $0 |
| 3 | GSWC > Cal Advocates | $8,500 | $55,200 | $4,844,800 |
| 4 | Cal Advocates as % of GSWC | 95% | 95% | 0% |

The table below compares GSWC's and Cal Advocates' recommended capital budgets for non-pipeline projects by project description.

**<u>Table 2-2: Non-Pipeline Capital Projects – Los Alamitos CSA</u>**

| | (A) Description | (B) Year | (C) GSWC | (D) Cal Advocates | (E) GSWC > Cal Advocates | (F) Cal Advocates as % of GSWC |
|---|---|---|---|---|---|---|
| 1 | Ball Plant, Site Improvements | 2021 | $169,900 | $161,400 | $8,500 | 95% |
| 2 | Ball Plant, Land Acquisition | 2023 | $2,052,200 | $0 | $2,052,200 | 0% |
| 3 | Ball Plant, Fe and Mn Removal System | 2023 | $2,792,600 | $0 | $2,792,600 | 0% |
| 4 | Cherry Plant, Replace Backwash Tank and Chemical Building | 2022 | $666,200 | $629,500 | $36,700 | 95% |
| 5 | Florista Plant, Site Improvements | 2022 | $338,300 | $319,800 | $18,500 | 95% |

Cal Advocates' recommended capital budget is the result of the following adjustments:

- The Commission should deny funding in rates for the Ball Plant Land Acquisition and the Ball Plant Iron ("Fe") and Manganese ("Mn") Removal System because Ball Well No. 1 has low levels of manganese and more cost-effective alternatives exist.
- The Commission should adjust the project estimates for the remaining projects consistent with the Cal Advocates' contingency and escalation factors recommendations in Chapter 1 of this testimony.

## III. <u>Discussion</u>

### A. <u>Ball Plant Fe and Mn Removal System</u>

The Commission should deny funding in rates for the Ball Plant Fe and Mn Removal System because Ball Well No. 1 has low levels of manganese which comply with drinking water requirements and more cost-effective alternatives exist.

GSWC plans to spend $4,844,800 in capital additions to address discolored water complaints in the West Orange system. GSWC proposes to install a new Fe and Mn Removal System at Ball Well No. 1 in 2023 for $2,792,600. To accommodate the removal system, GSWC states that it must acquire land in 2023 for an additional $2,052,200. The upfront capital costs would therefore be $4,844,800 in total. This total does not consider continuous operating and maintenance costs for the removal system, including purchased power and chemicals, or the return that GSWC will recover for both the treatment system and the non-depreciable land asset.

With these capital additions, GSWC aims to address discolored water complaints. From 2016 to 2019, GSWC states that the West Orange County system received 140 discolored water complaints.[40] GSWC believes that manganese entering the system from Ball Well No. 1 contributes to the cause of these complaints. GSWC explains that manganese can accumulate in the distribution system and then enter customer service lines when flow direction or velocity changes disturb the accumulated manganese.[41]

The secondary Maximum Contaminant Level ("SMCL") regulates the concentration of manganese in groundwater wells. The California Code of Regulations establishes a SMCL of 0.050 milligrams per liter ("mg/L") for manganese.[42] The State Water Resources Control Board's Division of Drinking Water ("DDW") states that the SMCL for manganese is a standard established to address issues of aesthetics (discoloration), not health concerns. Accordingly, the California Code of Regulations also refers to SMCLs as "Consumer Acceptance Contaminant Levels." Additionally, DDW states that the detection limit for purposes of reporting ("DLR") is 0.020 mg/L for manganese. DDW explains that the DLR is "the level at which it is confident about the

[40] GSWC Hanford and Insco Testimony, p. 192, line 12.
[41] GSWC Hanford and Insco Testimony, p. 192, lines 12-20.
[42] California Code of Regulations, Title 22, §64449 Secondary Maximum Contaminant Levels and Compliance.
https://govt.westlaw.com/calregs/Document/I2260318DFFF045529B9496276F3A8573?contextData=%28sc.Default%29&transitionType=Default.

quantification of manganese's presence in drinking water."[43] When a sample is below the DLR, the concentration measurement is less reliable.

The California Code of Regulations determines that a well is compliant with a SMCL if the well's running annual average of four consecutive quarterly samples is below the SMCL.[44] To compare Ball Well No. 1's running annual averages to the SMCL, Cal Advocates first averages same-quarter samples provided by GSWC.[45] Then, Cal Advocates calculates the running annual averages from these quarters. The table below summarizes the quarterly and running annual averages. The table below shows averages that are less than ("<") 0.020 mg/L to compare to the DLR. Nevertheless, these sample averages should be properly reported as "<0.020 mg/L."

**Table 2-3: Ball Well No. 1 Mn Concentration**

| | **(A) Quarter** | **(B) Quarterly Average (mg/L)** | **(C) Running Annual Average (mg/L)** |
|---|---|---|---|
| 1 | Q1 2016 | 0.014 | N/A |
| 2 | Q2 2016 | 0.015 | N/A |
| 3 | Q3 2016 | 0.015 | N/A |
| 4 | Q4 2016 | 0.015 | 0.015 |
| 5 | Q1 2017 | 0.014 | 0.015 |
| 6 | Q2 2017 | 0.016 | 0.015 |
| 7 | Q3 2017 | 0.018 | 0.016 |
| 8 | Q4 2017 | N/A | N/A |
| 9 | Q1 2018 | 0.031 | N/A |
| 10 | Q2 2018 | 0.019 | N/A |
| 11 | Q3 2018 | 0.019 | N/A |
| 12 | Q4 2018 | 0.017 | 0.022 |
| 13 | Q1 2019 | 0.014 | 0.017 |
| 14 | Q2 2019 | 0.022 | 0.018 |

[43] DDW. "Drinking Water Notification Level for Manganese." Web. https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/Manganese.html#:~:text=Manganese%20is%20regulated%20by%20a%200.05-mg%2FL%20secondary%20maximum,secondary%20standard%20for%20manganese%20is%20a%20non-enforceable%20guideline.%29

[44] California Code of Regulations, Title 22, §64449 (c) (1). https://govt.westlaw.com/calregs/Document/I2260318DFFF045529B9496276F3A8573?contextData=%28sc.Default%29&transitionType=Default.

[45] GSWC Hanford and Insco Testimony, Volume 9 of 10, Attachment LA01, pp. 1-2.

| | | | |
|---|---|---|---|
| 15 | Q3 2019 | 0.019 | 0.018 |
| 16 | Q4 2019 | 0.020 | 0.019 |

GSWC is compliant with the SMCL for manganese. Even the highest running annual average during this period, 0.022 mg/L, is less than half the SMCL and barely above the DLR. This period's most recent running annual average is 0.019 mg/L. GSWC's Ball Well No. 1 is therefore fully compliant with the applicable drinking water requirement. Additionally, the analysis above shows that all but one of the 2016-2019 running annual averages are below the DLR of 0.020 mg/L. The Commission should therefore find that manganese's concentration in Ball Well No. 1 is compliant with the SMCL and below the DLR.

Findings in the Water Research Foundation's report on manganese treatment ("WRF report") also do not support installing treatment at Ball Well No. 1. In its application, GSWC refers to the WRF report's "target" concentration of 0.015 mg/L for manganese in finished water to avoid manganese precipitation.[46] The WRF report gives 0.015 mg/L as a "target" not as a maximum acceptable level of manganese.[47] Instead, the WRF report's chapter on treatment technologies states that utilities can control the consequences of manganese in drinking water by reaching "very low" manganese levels such as <0.015 to 0.020 mg/L.[48] Since the Ball Well No. 1's manganese concentration is already within this range, the well's supply is comparable to water already treated for manganese. Therefore, the Commission should not find that the WRF report supports installing treatment at Ball Well No. 1.

GSWC misattributes the entire water system's discolored water complaints to Ball Well No. 1. GSWC states that the West Orange system receiving 140 discolored water complaints is an effect of precipitated manganese from Ball Well No. 1.[49] In response to discovery, GSWC verified that Ball Well No. 1 does not serve all areas of the West

---

[46] GSWC Hanford and Insco Testimony, p. 193, lines 3-6.
[47] GSWC Hanford and Insco Testimony, Volume 9 of 10, Attachment LA04, p. 24.
[48] GSWC Hanford and Insco Testimony, Volume 9 of 10, Attachment LA04, p. 70.
[49] GSWC Hanford and Insco Testimony, p. 192, lines 10-12.

Orange system. Accordingly, GSWC provided the number of complaints made by customers within Ball Well No. 1's service area. Approximately 15,000 connections are within this service area.[50] In comparison, DDW reports that the West Orange system has about 27,000 connections.[51] The following table compares the number of complaints that customers made within and outside of the service area.

**Table 2-4: Ball Well No. 1 Service Area Discolored Water Complaints**

| | (A) | (B) 2017 | (C) 2018 | (D) 2019 |
|---|---|---|---|---|
| 1 | System Total Complaints[52] | 48 | 23 | 43 |
| 2 | Out-of-Area Complaints | 28 | 10 | 12 |
| 3 | In-Area Complaints[53] | 20 | 13 | 31 |
| 4 | In-Area Connections | 15,000 | 15,000 | 15,000 |
| 5 | In-Area Complaints as % of Connections | 0.13% | 0.09% | 0.21% |

The Commission should not rely on complaint totals to justify installing treatment because the totals include complaints not caused by water from Ball Well No. 1. First, customers outside of Ball Well No. 1's service area make a significant portion of the complaints. For example, the table above shows that these customers made more complaints than those served by Ball Well No. 1 in 2017. Second, complaint totals include those caused by other sources of manganese within the same service area. In 2016, the peak year for complaints, GSWC noted that discolored water was caused by manganese treatment equipment failure at the Bloomfield Plant.[54] Third, complaint totals

[50] Attachment 2-1, GSWC Response to Public Advocates Data Request AA9-014, Q.2.

[51] GSWC Response to Minimum Data Requirements #II.G.6 ("GSWC MDR Response #II.G.6"), Orange County, WOC, 20171017 3010022 Inspection Report Rev.pdf, p. 1.

[52] Attachment 2-2, GSWC Response to Public Advocates Data Request AA9-002, Attachment AA9-002 Q.3a.

[53] Attachment 2-1, GSWC Response to Public Advocates Data Request AA9-014, Q.2f.

[54] GSWC MDR Response #II.G.6, Orange County, WOC, 20171017 3010022 Inspection Report Rev.pdf, pp. 5-6, 9 and 14.

include those caused by issues unrelated to manganese. In 2019, GSWC's complaint summary pointed to construction work as contributing to the year's total.[55]

To address discolored water complaints, GSWC should improve its flushing program instead of installing manganese treatment. Even if GSWC did spend $4,844,800 to prevent manganese from entering the West Orange system's distribution, GSWC would still need to eliminate the distribution's current accumulated manganese. Indeed, GSWC states that it would use the Fe and Mn Removal system in conjunction with a unidirectional flushing program.[56]

GSWC has a plan to implement superior flushing that will conserve water compared to conventional flushing. GSWC states that Neutral Output Discharge Elimination System ("NO-DES") filters make NO-DES flushing possible. GSWC further states that NO-DES flushing is "superior to conventional flushing as it removes sediments and particulate matter during the flushing operation and conserves water."[57] GSWC accordingly plans to add $21,000 per year to expenses for the Orange County district, the district overseeing the West Orange County system, to begin NO-DES flushing.

The Commission should authorize GSWC's proposed NO-DES flushing program rather than the nearly $5 million in capital additions and resulting operating and maintenance expenses. In this GRC cycle, GSWC plans to both install treatment and use NO-DES flushing. According to NO-DES, Inc., its flushing can remove settled particulates, iron, and manganese.[58] NO-DES, Inc. also reports specific instances of iron and manganese removal.[59] Therefore, annual NO-DES flushing by itself is an alternative to address precipitated manganese.

---

[55] Attachment 2-2, GSWC Response to Public Advocates Data Request AA9-002, Attachment AA9-002 Q.3a.
[56] GSWC Hanford and Insco Testimony, p. 193, lines 7-8.
[57] GSWC Prepared Testimony of Brad Powell, p. 10, lines 11-16.
[58] NO-DES Inc., FAQ's, web. https://www.no-des.com/faqs.
[59] NO-DES Inc., Particulate Removal, web. https://www.no-des.com/particulate-removal/.

In the long-term, the NO-DES flushing program is more cost-effective than installing treatment. GSWC estimates savings of $49,000 per year from reducing flushing in Ball Well No. 1's service area.[60] This is a high estimate for flushing the service area for a few reasons. First, GSWC will need to flush the service area periodically whether or not it installs treatment.[61] Indeed, GSWC has an annual flushing program.[62] Second, GSWC's estimate includes $18,000 for the cost of water lost in flushing. However, NO-DES flushing will conserve water during flushing operations. In comparison, NO-DES flushing's material expenses will be lower than conventional flushing's cost of water. Districtwide, GSWC plans to spend $21,000 for enough NO-DES filters to flush 48,000 hundred cubic feet ("CCF") per year.[63] This water volume is much greater than the 5,660 CCF that GSWC estimates it will use to flush the Ball Well No. 1 service area. Cal Advocates calculates that implementing NO-DES flushing will save about $135,000 in non-revenue water costs for the three districts where GSWC plans to use it.[64] Third, GSWC assumes that it will only pay its operators at their overtime rate to flush the service area. Even after considering labor inflation and water cost escalation, GSWC's high estimate for flushing the service area over 20 years is under $2,000,000.[65] Over 20 years, however, the cost to ratepayers for the Fe and Mn removal system would be over $10,000,000.[66]

For these reasons, GSWC should not spend $4,844,800 in capital additions to address discolored water complaints. The applicable SMCL for manganese is more than double Ball Well No. 1's 2016-2019 running annual average. Most of the quarter

---

[60] Attachment 2-3, GSWC Response to Public Advocates Data Request AA9-002, Attachment AA9-002 Q.2d.
[61] Attachment 2-1, GSWC Response to Public Advocates Data Request AA9-014, Q.2b.
[62] GSWC MDR Response #II.G.6, Orange County, WOC, 20171017 3010022 Inspection Report Rev.pdf, p. 16.
[63] Attachment 2-4, GSWC Response to Public Advocates Data Request LCN-003, Q.1. Note: 36 million gallons of water is equal to 48,000 CCF rounded to two significant digits
($36{,}000{,}000 \text{ gallons} \times \frac{1 \text{ cubic foot}}{7.4805 \text{ gallons}} \times \frac{1 \text{ CCF}}{100 \text{ cubic feet}} = 48{,}125 \text{ CCF}$).
[64] Attachment 2-5, Water Savings due to Implementation of NO-DES Flushing.
[65] Attachment 2-3, GSWC Response to Public Advocates Data Request AA9-002, Attachment AA9-002 Q.2d, Cell B18.
[66] Attachment 2-6, Cal Advocates Fe and Mn Removal System Revenue Requirement Analysis.

averages for manganese are below DDW's DLR and are considered very low by the WRF. While GSWC has reported discolored water complaints that it attributes to Ball Well No. 1, there are other causes such as equipment failures and construction work that GSWC acknowledges has contributed to its reported complaint numbers. GSWC should instead implement NO-DES flushing, which NO-DES, Inc. reports will remove iron and manganese. Finally, in the long-term, flushing is more cost-effective than installing treatment.

### B. Ball Plant Land Acquisition

The Commission should deny funding in rates for the Ball Plant Land Acquisition because the land would not be needed without the Ball Plant Fe and Mn Removal System. GSWC states that it needs a land acquisition because the Ball Plant is not large enough to install the proposed Fe and Mn removal system.[67] As Cal Advocates explains in the preceding section, the West Orange County system does not need the Fe and Mn removal system. Therefore, the system does not need the land acquisition.

## IV. Conclusion

The Commission should adjust GSWC's estimated capital budget for non-pipeline projects in the Los Alamitos CSA. Specifically, the Commission should:

- Deny funding for the Ball Plant Land Acquisition and Fe and Mn Removal System because Ball Well No. 1 has low levels of manganese and more cost-effective alternatives exist.
- Adjust estimates for the remaining projects consistent with the Cal Advocates' contingency and escalation factors recommendations in Chapter 1 of this testimony.

---

[67] GSWC Hanford and Insco Testimony, p. 191, lines 16-17.

# CHAPTER 3: PLACENTIA CSA

## I. Introduction

This chapter provides Cal Advocates' recommended adjustments to GSWC's non-pipeline capital projects for the Placentia CSA. The Placentia CSA is composed of the Cowan Heights and the Placentia-Yorba Linda systems.

## II. Summary of Recommendations

The table below summarizes GSWC's and Cal Advocates' recommended capital budgets for non-pipeline projects by year.

**Table 3-1: Non-Pipeline Capital Budget – Placentia CSA**

| | (A) Description | (B) 2021 | (C) 2022 | (D) 2023 |
|---|---|---|---|---|
| 1 | GSWC | $416,600 | $6,847,600 | $3,804,300 |
| 2 | Cal Advocates | $0 | $6,153,900 | $3,357,900 |
| 3 | GSWC > Cal Advocates | $416,600 | $693,700 | $446,400 |
| 4 | Cal Advocates as % of GSWC | 0% | 90% | 88% |

The table below compares GSWC's and Cal Advocates' recommended capital budgets for non-pipeline projects by project description.

**Table 3-2: Non-Pipeline Capital Projects – Placentia CSA**

| | (A) Description | (B) Year | (C) GSWC | (D) Cal Advocates | (E) GSWC > Cal Advocates | (F) Cal Advocates as % of GSWC |
|---|---|---|---|---|---|---|
| 1 | Clearview, Reservoir Replacements | 2023 | $3,804,300 | $3,357,900 | $446,400 | 88% |
| 2 | Hunting Horn, Reservoir Replacement | 2022 | $1,638,700 | $1,546,200 | $92,500 | 94% |
| 3 | Concerto, Booster Pump | 2022 | $914,700 | $555,100 | $359,600 | 61% |
| 4 | Concerto, Remove Uranium System and Destroy Well | 2022 | $440,100 | $416,000 | $24,100 | 95% |
| 5 | Fairmont Oak Meadow, PRV | 2021 | $416,600 | $0 | $416,600 | 0% |
| 6 | Bradford Well No. 3 Replacement | 2022 | $3,752,200 | $3,540,300 | $211,900 | 94% |
| 7 | La Jolla, Site Improvements | 2022 | $101,900 | $96,300 | $5,600 | 95% |

Cal Advocates' recommended capital budget is the result of the following adjustments:

- The Commission should adjust funding in rates for the Clearview Reservoir Replacements because a single-reservoir design is more cost-effective.
- The Commission should adjust funding for the Concerto Booster Pump upgrade because a pump building is not needed.
- The Commission should deny funding for the Fairmont Oak Meadow pressure regulating valve ("PRV") because it is not necessary to relocate the PRV to improve safety.

- The Commission should adjust the project estimates for the remaining projects consistent with the Cal Advocates' contingency and escalation factors recommendations in Chapter 1 of this testimony.

## III. Discussion

### A. Clearview Reservoir Replacements

The Commission should adjust funding in rates for the Clearview Reservoir Replacements because a single-tank design is more cost-effective.

GSWC plans to spend $3,804,300 in 2023 to replace two concrete reservoirs with a current combined capacity of 0.209 million gallons ("MG"). GSWC plans to replace the existing reservoirs with two 0.10 MG steel tanks.[68]

In general, a tank with a larger capacity has a lower unit cost than a tank with a smaller capacity. GSWC shows this in the "master cost cross-reference" that serves as GSWC's source for historical costs of capital projects.[69] GSWC's master cost cross-reference shows that a 0.75 MG tank has a cost of $2.44 per gallon compared to a 0.25-MG tank which has a cost of $3.01 per gallon.[70] GSWC estimates a $4.00 per gallon unit cost for its two planned 0.10-MG tanks. As a result, the base construction cost of GSWC's two planned tanks is $800,000.[71]

A single-tank alternative with a 0.20-MG capacity is more cost-effective than two 0.010 MG tanks. Cal Advocates calculates that its contingency and escalation recommendations alone would reduce GSWC's estimate for the Clearview Reservoirs to $3,566,300. To calculate the cost of the single-tank alternative, Cal Advocates replaced the construction cost for GSWC's two planned tanks with an estimate based on a unit cost of $3.30 for a 0.20 MG tank. Cal Advocates interpolated this unit cost using GSWC's estimates of $4.00 for a 0.10 MG tank and $3.01 for a 0.25 MG tank.[72] After

---

[68] GSWC Hanford and Insco Testimony, p. 202, line 21 through p. 203, line 3.
[69] GSWC Hanford and Insco Testimony, p. 14, lines 19-23.
[70] GSWC Hanford and Insco Testimony, Volume 1 of 10, Attachment 5, pp. 4-5.
[71] GSWC Rate Base Workpapers, Capital, PCEs, PCE_RIII – Cowan Heights (Clearview, Reservoir Replacement Project.xlsx, tab "Construction Cost," row 18.
[72] $\$4.00 + \frac{(\$3.01-\$4.00)}{(0.25-0.10)} \times 0.20 \approx \$3.30$.

making changes to the project's construction cost, contingency, and escalation, Cal Advocates estimate for the single-tank alternative is $3,357,000. This estimate is about $200,000 less than the two-tank estimate with Cal Advocates' recommended contingency and escalation.[73] Therefore, a single-tank alternative would save about $200,000 in upfront capital additions.

In response to discovery, GSWC first stated that Clearview Plant was not physically large enough to accommodate a 0.20 MG tank.[74] When Cal Advocates asked GSWC to explain why, GSWC stated that it would need to build the 0.20-MG tank 30-feet high to fit the site's space. GSWC stated that:

> It would be very difficult, if not impossible, to obtain an approval from the Orange County Planning Commission ["OCPC"] to construct a 30-foot tall steel tank in this mature neighborhood.[75]

The Commission should not authorize funding for a more expensive project because GSWC believes the OCPC will deny a cost-effective project. The Clearview Plant site is located within an unincorporated area of Orange County. The County's General Plan is the authority for zoning regulations within the County's unincorporated areas. The General Plan shows that no zoning regulations prohibit GSWC from building a structure that is less than 35 feet tall.[76]

GSWC should not replace the Clearview reservoirs with two 0.10 MG tanks. The Commission should adjust funding for the Clearview Reservoir Replacements because a more cost-effective alternative exists. The Commission should instead base funding on the estimate for a single-tank with a 0.20-MG capacity. Cal Advocates' recommended budget above in Tables 3-1 and 3-2 is based on a $3.30 unit cost for a 0.20 MG tank. Cal Advocates also applied its recommended contingency and escalation factors adjustments to this budget.

---

[73] $\$3,566,300 - \$3,357,900 = \$208,400.$

[74] Attachment 3-1, GSWC Response to Public Advocates Data Request AA9-005, Q.5.

[75] Attachment 3-2, GSWC Response to Public Advocates Data Request AA9-007, Q.1a.

[76] Attachment 3-3, County of Orange General Plan, Chapter X Housing Element, Table X-35: Summary of Residential Zoning Regulations.

B. Concerto Booster Pump

The Commission should adjust funding for the Concerto Booster Pump upgrade because a pump building is not needed.

GSWC proposes to construct an unnecessary pump building to house the replacement Concerto Booster Pump. GSWC plans to spend $914,700 to replace the Concerto Booster Pump because the upgraded replacement will allow GSWC to transfer water within the Placentia-Yorba Linda system. GSWC does not explain the need for a pump building in its testimony for the project at the Concerto Booster Pump Station ("BPS").[77] GSWC nevertheless includes a 500 square foot ("SF") building in its project cost estimate.[78]

In response to discovery, GSWC explained that it plans to construct a pump building at the Concerto BPS because the existing pump enclosure is in poor condition and because a building would provide better sound attenuation.[79] To explain the building's planned space of 500 SF, GSWC stated that the building would also house a motor control center and programmable logic controller.[80] Based on site photographs, this equipment is currently enclosed like the pump.[81] Given that GSWC can replace the existing pump enclosure with a similar enclosure, GSWC's sole reason to construct the building is to reduce noise. However, there are no recorded noise complaints that can substantiate a noise problem.[82] The Commission should not presume that a noise problem exists at the Concerto BPS since there have been no noise complaints.

Cal Advocates' recommended adjustments to contingency and escalation reduce the total estimate for GSWC's Concerto project to $863,100. Removing the pump

---

[77] GSWC Hanford and Insco Testimony, p. 204, line 18, through p. 205, line 19.

[78] Rate Base Workpapers, Capital, PCEs, file "PCE_RIII – Yorba Linda (Concerto Booster Pump).xlsx," tab "Construction Cost," Row 14.

[79] Attachment 3-4, GSWC Response to Public Advocates Data Request AA9-011, Q.2a.

[80] Attachment 3-4, GSWC Response to Public Advocates Data Request AA9-011, Q.2c.

[81] Attachment 3-5, Concerto Site Photographs.

[82] Attachment 3-6, GSWC Response to Public Advocates Data Request AA9-017, Q.1a.

building replacement further reduces the project cost estimate to $555,100. Removing the pump building would therefore save $308,000 in upfront capital costs.[83]

The Commission should adjust funding by removing the pump building from the project cost estimate. Cal Advocates removed the pump building in the recommended capital budgets in Table 3-1 and 3-2 above.

### C. Fairmont Oak Meadow PRV

The Commission should deny funding for the Fairmont Oak Meadow PRV because it is not necessary to relocate the PRV to improve safety.

GSWC plans to spend $416,600 to relocate the Fairmont Oak Meadow PRV to the Fairmont BPS that is currently located on the opposite side of the street. GSWC states that the Fairmont Oak Meadow PRV and the Fairmont BPS work in tandem. To access both sites, GSWC's operators walk across Fairmont Boulevard. GSWC is concerned that these pedestrian crossings expose its operators to a high traffic volume street. Accordingly, GSWC plans to relocate the PRV so that its operators will not have to walk across the street.[84]

GSWC's current practices are a cost-effective alternative to the PRV relocation. In response to discovery, GSWC explained that it installed the Fairmont Oak Meadow PRV in 1972 and the Fairmont BPS in 1993.[85] Since it installed the BPS in 1993, GSWC has been able to access both sites for at least 27 years. Currently, GSWC instructs its operators how to safely access both sites. GSWC explained that it instructs operators to park all vehicles parallel to the street curb adjacent to the facilities, utilize emergency flashers and overhead lights, and set traffic cones for added visibility and safety.[86] GSWC's practices, especially the use of emergency flashers, overhead lights, and traffic cones, protect GSWC's operators by alerting traffic to their presence. These current

[83] $\$863{,}100 - \$555{,}100 = \$882{,}200.$

[84] GSWC Hanford and Insco Testimony, p. 207, lines 2-18.

[85] Attachment 3-4, GSWC Response to Public Advocates Data Request AA9-011, Q.3a.

[86] Attachment 3-4, GSWC Response to Public Advocates Data Request AA9-011, Q.3d.

practices ensure the safety of GSWC's operators and are an appropriate alternative to the PRV relocation.

If GSWC no longer believes that its current practices are safe enough, GSWC can reform its practices to further improve safety instead of relocating the PRV. GSWC acknowledged that its operators could drive from the Fairmont Oak Meadow PRV to the BPS as if they were visiting two sites.[87] To avoid pedestrian crossings entirely, GSWC can instruct its operators to return to their vehicles and drive from the PRV to the BPS location across the street.

GSWC should not spend $416,600 to relocate the Fairmont Oak Meadow PRV. GSWC's operators have been able to access the Fairmont Oak Meadow PRV and BPS for the last 27 years. GSWC's current practices allow operators to safely access both facilities without the PRV and BPS occupying the same site. If GSWC wants to further improve safety, GSWC can reform its practices to eliminate pedestrian crossings. Therefore, the Commission should deny funding for the PRV relocation.

## IV. Conclusion

The Commission should adjust GSWC's estimated capital budget for non-pipeline projects in the Placentia CSA. Specifically, the Commission should:

- Adjust funding in rates for the Clearview Reservoir Replacements because a single-reservoir design is more cost-effective.
- Adjust funding for the Concerto Booster Pump upgrade because a pump building is not needed.
- Deny funding for the Fairmont Oak Meadow PRV because it is not necessary to relocate the PRV.
- Adjust the project estimates for the remaining projects consistent with the Cal Advocates' contingency and escalation factors recommendations in Chapter 1 of this testimony.

[87] Attachment 3-4, GSWC Response to Public Advocates Data Request AA9-011, Q.3e.

# CHAPTER 4: CLAREMONT CSA

## I. Introduction

This chapter provides Cal Advocates' recommended adjustments to GSWC's non-pipeline capital projects for the Claremont CSA. The Claremont CSA is composed of the Claremont system.

## II. Summary of Recommendations

The table below summarizes GSWC's and Cal Advocates' recommended capital budgets for non-pipeline projects by year.

**Table 4-1: Non-Pipeline Capital Budget – Claremont CSA**

| | (A) Description | (B) 2021 | (C) 2022 | (D) 2023 |
|---|---|---|---|---|
| 1 | GSWC | $0 | $5,859,700 | $772,300 |
| 2 | Cal Advocates | $0 | $3,811,000 | $726,000 |
| 3 | GSWC > Cal Advocates | $0 | $2,048,700 | $46,300 |
| 4 | Cal Advocates as % of GSWC | N/A | 65% | 94% |

The table below compares GSWC's and Cal Advocates' recommended capital budgets for non-pipeline projects by project description.

**Table 4-2: Non-Pipeline Capital Projects – Claremont CSA**

| | (A) Description | (B) Year | (C) GSWC | (D) Cal Advocates | (E) GSWC > Cal Advocates | (F) Cal Advocates as % of GSWC |
|---|---|---|---|---|---|---|
| 1 | Town, Demolish Reservoir | 2023 | $143,100 | $134,500 | $8,600 | 94% |
| 2 | Lower O'Neil, Demolish Reservoir | 2022 | $140,400 | $132,700 | $7,700 | 95% |
| 3 | Del Monte, Replace Booster Station | 2022 | $2,463,200 | $1,441,900 | $1,021,300 | 59% |
| 4 | Padua, Improve and Recoat Reservoir | 2023 | $381,900 | $359,000 | $22,900 | 94% |
| 5 | Indian Hill North, Replace Booster Station | 2022 | $2,252,300 | $1,289,400 | $962,900 | 57% |
| 6 | Destroy Pomello Well No. 1 | 2023 | $154,600 | $145,300 | $9,300 | 94% |
| 7 | Destroy Pomello Well No. 4 | 2023 | $77,300 | $72,700 | $4,600 | 94% |
| 8 | Indian Hill North, Cathodic Protection | 2023 | $15,400 | $14,500 | $900 | 94% |
| 9 | Fire Hardening | 2022 | $1,003,800 | $947,000 | $56,800 | 94% |

Cal Advocates' recommended capital budget is the result of the following adjustments:

- The Commission should adjust funding for the Del Monte Booster Pump Station ("BPS") Replacement because replacing the pump building is not needed.
- The Commission should adjust funding for the Indian Hill North BPS Replacement because a pump building is not needed.

- The Commission should adjust the project estimates for the remaining projects consistent with the Cal Advocates' contingency and escalation factors recommendations in Chapter 1 of this testimony.

## III. Discussion

### A. Del Monte BPS Replacement

The Commission should adjust funding for the Del Monte BPS because replacing the pump building is not needed.

GSWC proposes to replace the pump building that houses the Del Monte booster pumps. GSWC plans to spend a total of $2,463,200 for the project at the Del Monte BPS to replace three existing booster pumps, install a fourth pump, and replace the pump building. GSWC plans to replace the building because it is over 70 years old. GSWC also states that the building should be upgraded to meet revised earthquake standards and to protect GSWC assets and operators.[88] Although the existing building is 1,575 square feet ("SF"), GSWC wants to construct the replacement building with a 2,000 SF size to access the equipment more easily for maintenance and repairs.[89]

GSWC can rehabilitate the Del Monte pump building instead of replacing it. In response to discovery, GSWC explained that records show the building is at least 70 years old and that no structural upgrades have been made to the building since 1959. GSWC also notes that bricks have become loose due to deteriorated mortar.[90] In general, the mortar between bricks has a shorter lifespan than bricks themselves. While bricks can have a lifespan exceeding 100 years, the mortar should be repaired or "repointed" every 25 years.[91] Given that the pump building's bricks are loosening but are less than 100 years old, GSWC should repoint the mortar instead of replacing the entire building.

To meet revised earthquake standards and protect its assets and operators, GSWC can also upgrade the pump building with seismic retrofits instead of replacing it. The

[88] GSWC Hanford and Insco Testimony, p. 222, lines 16-17.
[89] Attachment 4-1, GSWC Response to Public Advocates Data Request AA9-012, Q.2b.
[90] Attachment 4-1, GSWC Response to Public Advocates Data Request AA9-012, Q.2c.
[91] Attachment 4-2, Repointing (Tuckpointing) Brick Masonry. Brick Brief. The Brick Industry Association. July 2005.

Federal Emergency Management Agency ("FEMA") published *Techniques for the Seismic Rehabilitation of Existing Buildings* due to several countries' extensive research work into seismic rehabilitation.[92] This FEMA publication shows that unreinforced masonry buildings, including brick buildings, have several techniques to improve seismic deficiencies. For example, GSWC can install wall-to-roof and wall-to-floor ties to prevent walls from falling away from the roof and prevent the roof from sliding along the wall.[93] GSWC can also install vertical braces to improve the walls' bending resistance, or it can install steel moment frames to reduce the demands on the walls.[94] Since GSWC has these options to retrofit the building, GSWC does not need to replace the pump building.

Cal Advocates' recommended adjustments to contingency and escalation reduce the total estimate for GSWC's Del Monte project to \$2,324,100. Removing the pump building replacement further reduces the project cost estimate to \$1,441,900. Removing the pump building would therefore save \$882,200 in upfront capital costs.[95]

GSWC should not construct a new pump building to house the Del Monte booster pumps. The Commission should adjust funding by removing the pump building from the cost estimate. Cal Advocates removed the pump building in the recommended capital budgets in Table 4-1 and 4-2.

B. Indian Hill North BPS Replacement

The Commission should adjust funding for the Indian Hill North BPS because the new pump building, well house, and chemical building are not needed.

GSWC plans to spend \$2,252,300 to replace the three existing Indian Hill North booster pumps, build a new pump building, and replace the existing chemical building and well pump house. GSWC proposes to replace the three booster pumps because of

---

[92] Attachment 4-3, Techniques for the Seismic Rehabilitation of Existing Building, Preface.
[93] Attachment 4-4, Techniques for the Seismic Rehabilitation of Existing Building, Chapter 21, p. 21-12.
[94] Attachment 4-4, Techniques for the Seismic Rehabilitation of Existing Building, Chapter 21, p. 21-25 and p. 21-50.
[95] $\$2,324,100 - \$1,441,900 = \$882,200$.

their age, overall efficiency, and horizontal split casing. GSWC proposes to construct a pump building to reduce the noise from the three boosters that currently operate in the open.[96] GSWC would construct this pump building with a size of 1,400 SF.[97] To improve the accessibility of a well at the same site, GSWC also proposes replacements for the chemical building, chemical equipment, and well house. GSWC would construct the new well house with a removable roof.[98]

GSWC proposes to construct a pump building to reduce the noise produced by the Indian Hill North booster pumps but does not substantiate that a noise problem exists. As it states in its testimony, GSWC currently operates the existing Indian Hill North BPS without a pump building.[99] GSWC has been able to operate the existing pumps without the need to reduce noise for at least the last 50 years based on the age of booster D. In response to discovery, GSWC also confirmed that the City of Claremont does not require GSWC to house its booster pumps in a building.[100] Most importantly, there are no recorded noise complaints that can substantiate a noise problem.[101] The Commission should not presume that a noise problem exists at the Indian Hill North BPS especially since neighbors have not made noise complaints.

GSWC does not need to replace the existing chemical building and well house to improve accessibility. GSWC states that the existing BPS, chemical building and overhead lines restrict access to Indian Hill Well No. 3 at the same site.[102] GSWC will, however, relocate the BPS further away from the well, which will improve access to the well.[103] During Cal Advocates' field investigation, Cal Advocates noticed that the well house is on rails and has the ability to roll away for well pump and motor maintenance.[104]

---

[96] GSWC Hanford and Insco Testimony, p. 223, line 12 to p. 224, line 3.
[97] GSWC Rate Base Workpapers, Capital, PCEs, file "PCE_RII – Claremont (Indian Hill North, Replace Booster Station).xlsx," tab "Construction Cost," Row 18.
[98] GSWC Hanford and Insco Testimony, p. 224, lines 4-10.
[99] GSWC Hanford and Insco Testimony, p. 224, lines 1-2.
[100] Attachment 4-1, GSWC Response to Public Advocates Data Request AA9-012, Q.2c.
[101] Attachment 3-6, GSWC Response to Public Advocates Data Request AA9-017, Q.1b.
[102] GSWC Hanford and Insco Testimony, p. 224, lines 4-10.
[103] Attachment 4-1, GSWC Response to Public Advocates Data Request AA9-012, Attachment Q.3e.
[104] Attachment 4-5, Cal Advocates Indian Hill North Site Photographs.

Cal Advocates also noticed that the overhead lines are more than 14 feet high and should not prevent a service truck from reaching the well house. Additionally, GSWC confirmed that a service truck has been able to access the site's well pumps and motors.[105] Since GSWC will move the BPS away from the well, has already configured the existing well house to roll-away, and can bring in a truck to service the well, GSWC does not need to further improve accessibility by replacing the chemical building and well house.

Cal Advocates' recommended adjustments to contingency and escalation reduce the total estimate for the Indian Hill North BPS project to $2,125,200. Removing the new pump building, chemical building replacement, and well house replacement, further reduces the project cost estimate to $1,289,400. Removing the new and replacement buildings from GSWC's proposed capital budget would therefore save $835,800 in upfront capital costs.[106]

GSWC should not construct a pump building to house the BPS or replace the chemical building and well house. The Commission should adjust funding by removing the new and replacement buildings from the cost estimate. Cal Advocates removed the pump building in the recommended capital budgets in Table 4-1 and 4-2.

## IV. <u>Conclusion</u>

The Commission should adjust GSWC's estimated capital budget for non-pipeline projects in the Claremont CSA. Specifically, the Commission should:

- Adjust funding in rates for the Del Monte BPS Replacement because replacing the pump building is not necessary.
- Adjust funding for the Indian Hill North BPS Replacement because a pump building is not needed.

[105] Attachment 4-1, GSWC Response to Public Advocates Data Request AA9-012, Q.3f.
[106] $\$2{,}125{,}200 - \$1{,}289{,}400 = \$835{,}800$.

- Adjust the project estimates for the remaining projects consistent with the Cal Advocates' contingency and escalation factors recommendations in Chapter 1 of this testimony.

# CHAPTER 5: SAN DIMAS CSA

## I. Introduction

This chapter provides Cal Advocates' recommended adjustments to GSWC's non-pipeline capital projects for the San Dimas CSA. The San Dimas CSA is composed of the San Dimas system.

## II. Summary of Recommendations

The table below summarizes GSWC's and Cal Advocates' recommended capital budgets for non-pipeline projects by year.

**Table 5-1: Non-Pipeline Capital Budget – San Dimas CSA**

| | (A) Description | (B) 2021 | (C) 2022 | (D) 2023 |
|---|---|---|---|---|
| 1 | GSWC | $4,153,100 | $3,541,500 | $0 |
| 2 | Cal Advocates | $3,943,000 | $3,341,500 | $0 |
| 3 | GSWC > Cal Advocates | $210,100 | $200,000 | $0 |
| 4 | Cal Advocates as % of GSWC | 95% | 94% | N/A |

The table below compares GSWC's and Cal Advocates' recommended capital budgets for non-pipeline projects by project description.

**Table 5-2: Non-Pipeline Capital Projects – San Dimas CSA**

| | (A) Description | (B) Year | (C) GSWC | (D) Cal Advocates | (E) GSWC > Cal Advocates | (F) Cal Advocates as % of GSWC |
|---|---|---|---|---|---|---|
| 1 | Highway, Replace Reservoir | 2021 | $625,800 | $594,600 | $31,200 | 95% |
| 2 | Baseline Well No. 3 Replacement | 2021 | $3,527,300 | $3,348,400 | $178,900 | 95% |
| 3 | Columbia Well Replacement | 2022 | $3,541,500 | $3,341,500 | $200,000 | 94% |

Cal Advocates' recommended capital budget is the result of the following adjustment:

- The Commission should adjust the project estimates for the remaining projects consistent with the Cal Advocates' contingency and escalation factors recommendations in Chapter 1 of this testimony.

## III. Discussion

Cal Advocates does not recommend further adjustments to the San Dimas CSA's non-pipeline projects.

## IV. Conclusion

The Commission should adjust GSWC's estimated capital budget for non-pipeline projects in the San Dimas CSA consistent with the Cal Advocates' contingency and escalation factors recommendations.

# CHAPTER 6: SAN GABRIEL VALLEY CSA

## I. Introduction

This chapter provides Cal Advocates' recommended adjustments to GSWC's non-pipeline capital projects for the San Gabriel Valley CSA. The San Gabriel Valley CSA is composed of the South San Gabriel and South Arcadia systems.

## II. Summary of Recommendations

The table below summarizes GSWC's and Cal Advocates' recommended capital budgets for non-pipeline projects by year.

**Table 6-1: Non-Pipeline Capital Budget – San Gabriel Valley CSA**

| | (A)<br>Description | (B)<br>2021 | (C)<br>2022 | (D)<br>2023 |
|---|---|---|---|---|
| 1 | GSWC | $279,300 | $7,342,200 | $7,656,300 |
| 2 | Cal Advocates | $265,400 | $2,936,900 | $0 |
| 3 | GSWC ><br>Cal Advocates | $13,900 | $4,405,300 | $7,656,300 |
| 4 | Cal Advocates as % of GSWC | 95% | 40% | 0% |

The table below compares GSWC's and Cal Advocates' recommended capital budgets for non-pipeline projects by project description.

**Table 6-2: Non-Pipeline Capital Projects – San Gabriel Valley CSA**

| | (A) Description | (B) Year | (C) GSWC | (D) Cal Advocates | (E) GSWC > Cal Advocates | (F) Cal Advocates as % of GSWC |
|---|---|---|---|---|---|---|
| 1 | Saxon, Install Booster Station | 2023 | $2,328,700 | $0 | $2,328,700 | 0% |
| 2 | Saxon Well No. 3 Replacement | 2022 | $3,112,600 | $2,936,900 | $175,700 | 94% |
| 3 | Saxon, Construct 0.75 MG Reservoir | 2022 | $2,182,200 | $0 | $2,182,200 | 0% |
| 4 | Jeffries, Fencing | 2022 | $537,300 | $0 | $537,300 | 0% |
| 5 | Jeffries, Construct Booster Station | 2023 | $2,484,300 | $0 | $2,484,300 | 0% |
| 6 | Jeffries, Construct 1.25 MG Reservoir | 2023 | $2,843,300 | $0 | $2,843,300 | 0% |
| 7 | Encinita, New Field Office | 2022 | $1,510,100 | $0 | $1,510,100 | 0% |
| 8 | Farna, Seismic Upgrades | 2021 | $279,300 | $265,400 | $13,900 | 95% |

Cal Advocates' recommended capital budget is the result of the following adjustments:

- The Commission should deny funding in rates for the new Saxon 0.75 MG Reservoir and BPS because the South San Gabriel system has enough water supply to meet its demands without a new reservoir.
- The Commission should deny funding for the new Encinita Field Office because the existing Saxon Field Office does not need to be demolished.
- The Commission should deny funding for the Jeffries 1.25 MG Reservoir, BPS, and fencing because the South Arcadia system has enough water supply to meet its demands without a new reservoir.

- The Commission should adjust the project estimates for the remaining projects consistent with the Cal Advocates' contingency and escalation factors recommendations in Chapter 1 of this testimony.

# III. Discussion

## A. Saxon 0.75 MG Reservoir

The Commission should deny funding for the 0.75 MG Saxon Reservoir because the South San Gabriel system has enough water supply to meet its demands without a new reservoir.

To meet self-imposed storage criteria, GSWC proposes to build the 0.75 MG Saxon Reservoir, BPS, and field office replacement for a total of $6,021,000. GSWC plans to spend $2,182,200 to build the 0.75 MG reservoir and $2,328,700 to build the BPS to pump from the reservoir.[107] However, to accommodate the proposed reservoir and BPS at the Saxon Plant, GSWC must also demolish the site's existing field office and reconstruct it elsewhere. Accordingly, GSWC plans to spend another $1,510,100 to replace the field office.[108]

GSWC states that it should build a 0.75 MG reservoir to meet a 0.66 MG storage deficiency identified in its master plan.[109] The South San Gabriel Master Plan, like GSWC's other system master plans, has two applicable analyses: a "supply and capacity analysis" and a "storage analysis." GSWC's 0.66 MG storage deficiency is a result of the latter analysis. The supply and capacity analysis measures the system's ability to meet several planning scenarios. The demands of GSWC's planning scenarios can be stricter than regulatory requirements.[110] By showing that facilities meet the demands of planning scenarios, however, GSWC's supply and capacity analysis can show that facilities exceed regulatory requirements. GSWC's storage analysis is based on storage criteria that GSWC applies to its system because the Commission and DDW do not provide specific

[107] GSWC Hanford and Insco Testimony, p. 245, line 4, and p. 248, line 2.
[108] GSWC Hanford and Insco Testimony, p. 251, line 9.
[109] GSWC Hanford and Insco Testimony, p. 248, lines 8-10.
[110] GSWC Hanford and Insco Testimony, Attachment C-35 South San Gabriel Master Plan, p. 5-2.

requirements for storage.  GSWC states that it developed its storage criteria after considering recommended standards published by the American Water Works Association ("AWWA").[111]

The California Waterworks Standards and local fire codes determine system supply deficiencies.  The Waterworks Standards require that a public water system and its pressure zones always have the source capacity to meet its MDD.[112]  Additionally, the Waterworks Standards require a system with 1,000 or more service connections and its pressure zones to meet four hours of PHD with a combination of source capacity, storage capacity, and emergency source connections.[113]  This requirement applies to the South San Gabriel system because it has nearly 5,000 service connections.[114]  The local fire flow requirements for the South San Gabriel system depend on its buildings' size and construction.[115]  GSWC determined that the largest fire flow for the system's Main zone is 3,500 gallons per minute ("gpm") for a duration of three hours.[116]  The local fire flow requirements do not require that a system supply fire flow from a reservoir.

The demands of GSWC's planning scenarios are stricter than the Waterworks Standards and local fire flow requirements.  GSWC's planning scenarios include, among others, when the largest capacity well is offline during the PHD, when the largest fire flow occurs during the MDD, and when the largest MWD supply has an outage during the MDD.  While the Waterworks Standards require that a zone be able to meet four hours of PHD from its source, storage, and emergency source capacity, GSWC's planning scenario measures whether a zone can meet four hours of PHD with its source and storage capacity when the largest well is offline.  While the local fire code requires

---

[111] GSWC Hanford and Insco Testimony, Attachment C-35 South San Gabriel Master Plan, p. 5-2.
[112] California Code of Regulations, Title 22, § 64554 (a) and (a) (3). https://govt.westlaw.com/calregs/Document/I424D286FF5BB40D7978AF090BC99CCB0?contextData=%28sc.Default%29&transitionType=Default
[113] California Code of Regulations, Title 22, § 64554 (a) (1) and (a) (3).
[114] GSWC Hanford and Insco Testimony, Attachment C-35 South San Gabriel Master Plan, p. 3-2, Table 3-1.
[115] Los Angeles County Code of Ordinances, Title 32, B105.2 and California Fire Code, Table B105.1(2). https://up.codes/viewer/california/ca-fire-code-2016/chapter/B/fire-flow-requirements-for-buildings#B.
[116] GSWC Hanford and Insco Testimony, Attachment C-35 South San Gabriel Master Plan, p. 5-7.

fire flow up to 3,500 gpm for three hours, GSWC's planning scenario requires its zones to simultaneously meet this fire flow and the MDD.[117]

By meeting the demands of GSWC's planning scenarios, the South San Gabriel system facilities exceed the Waterworks Standards and local fire flow requirements. According to GSWC's supply and capacity analysis, the South San Gabriel system's Main zone can currently meet all planning scenarios without additional storage.[118] Therefore, the Main zone is compliant with applicable regulatory requirements. In addition, GSWC plans to replace the currently non-operational Saxon Well No. 3 in 2022.[119] The replacement well will have a capacity of 700 gpm.[120] As a result, GSWC's supply capacity will be greater than what the current master plan shows. The following table adds the supply of GSWC's planned Saxon Well No. 3 replacement and shows that the system can meet planning scenario demands without additional storage. Indeed, the table shows that after replacing Saxon Well No. 3, GSWC will have enough well and purchased water supply to meet all planning scenarios without using any storage.

[117] GSWC Hanford and Insco Testimony, Attachment C-35 South San Gabriel System, p. 5-2.
[118] GSWC Hanford and Insco Testimony, Attachment C-35 South San Gabriel System, p. 5-9.
[119] GSWC Hanford and Insco Testimony, p. 246, line 6.
[120] Attachment 6-1, GSWC Response to Public Advocates Data Request AA9-004, Q.3b.

**Table 6-3: Cal Advocates Supply and Capacity Analysis – South San Gabriel**

**Main Zone**

| | (A) | (B) Capacity | (C) Largest Well Offline During PHD | (D) Largest Fire Flow During MDD | (E) MWD Outage During MDD |
|---|---|---|---|---|---|
| 1 | Duration (Hours) | | 4 | 3 | 24 |
| 2 | Units | (gpm) | (gpm) | (gpm) | (gpm) |
| 3 | Demand | | | | |
| 4 | Main Zone | | 3,683 | 5,955 | 2,455 |
| 5 | Transfer to Teresa Booster Zone | | 251 | 167 | 167 |
| 7 | **Total Demand** | | **3,934** | **6,122** | **2,622** |
| 8 | Supply | | | | |
| 9 | Wells (total capacity) | 3,000 | -- | 3,000 | 2,622 |
| 10 | Wells (firm capacity)[121] | 2,000 | 2,000 | -- | -- |
| 11 | Purchased Water Connections | 3,375 | 1,934 | 3,122 | 0 |
| 12 | Reservoirs | | 0 | 0 | 0 |
| 13 | Reservoir Storage Used (MG) | 0.5 | 0 | 0 | 0 |
| 14 | **Total Supply** | | **3,934** | **6,122** | **2,622** |
| **15** | **Supply Meets Demand?** | | **Yes** | **Yes** | **Yes** |

Unlike the above analysis, GSWC's separate "storage analysis" examines water supplied by reservoirs specifically. GSWC states that it considered standards published by AWWA to develop its storage-only criteria.[122] Cal Advocates asked GSWC to provide the publication where AWWA recommended these standards. In response, GSWC provided a publication where AWWA recommends that water systems should consider PHD and fire flow when sizing reservoirs. In this publication, AWWA explains that sizing reservoirs requires a detailed analysis of water demands, supply sources, and

[121] The system or zone's capacity from wells that remains when the largest well is offline is known as the firm capacity.
[122] GSWC Hanford and Insco Testimony, Attachment C-35 South San Gabriel System, p. 5-2.

the distribution system.[123] AWWA, therefore, recognizes that systems that are sizing reservoirs should account for the system's supply sources.

GSWC's storage analysis has three components: operational, fire, and emergency storage. GSWC intends the operational component to regulate the difference between the rate of supply and the daily rate of usage. When usage is greater than well supply, the system can draw from operational storage. When well supply exceeds usage, the well can refill the operational storage. The fire component would provide up to the largest fire flow in each zone. The emergency component would provide a backup supply during a major source interruption.[124] GSWC calculates its storage deficiency from these components according to the table below:[125]

**Table 6-4 GSWC Storage Analysis – South San Gabriel Main Zone**

| | (A) Component | (B) Storage Volume (MG) |
|---|---|---|
| 1 | Operational Storage | 0.29 |
| 2 | Fire Storage | 0.42 |
| 3 | Emergency Storage | 1.09 |
| 4 | **Total Recommended Storage** | **1.80** |
| 5 | Available Storage | 0.41 |
| 6 | Purchased Water Amount | 0.74 |
| **7** | **Available Storage + Purchased Water Amount - Total Recommended Storage** | **-0.66** |

GSWC's existing supply sources can perform the functions of the storage components above. As an alternative to operational storage, GSWC can install variable frequency drives ("VFDs") to its well pumps. VFDs control a pump's rate of supply to the desired output. Since VFDs regulate the difference between supply and usage, operational storage can be reduced. GSWC has already installed a VFD on one of its largest wells in the system's Main zone.[126] GSWC does not need reservoirs to provide

[123] Attachment 6-2, GSWC Response to Public Advocates Data Request AA9-005, Attachment Q.6b.
[124] GSWC Hanford and Insco Testimony, Attachment C-35 South San Gabriel System, pp. 5-3 to 5-4.
[125] GSWC Hanford and Insco Testimony, Attachment C-35 South San Gabriel System, pp. 5-10 to 5-11.
[126] GSWC Hanford and Insco Testimony, Attachment C-35 South San Gabriel System, Figure 2-2.

fire flow. As shown by Table 6-3 above, the Main zone wells and purchased water will be able to simultaneously supply the MDD and largest fire flow of 3,500 gpm.

GSWC also does not need reservoirs to provide emergency supply. In case of a source interruption, a system can provide backup supply from an independent source, a reservoir, or a combination of both. GSWC states that industry standards for emergency storage range from 12 to 24 hours of average day demand ("ADD"). GSWC decides that an emergency storage component equal to 12 hours of ADD is appropriate because the South San Gabriel system has multiple sources and an existing reservoir.[127] The industry standards that GSWC refers to do not appear in the AWWA publication that GSWC provided. Even if other publications do recommend a specific emergency storage amount, water systems can provide this storage from groundwater basins.[128] For example, a master plan from the Sacramento Suburban Water District assumes that wells will pump all of its emergency storage from the basin.[129] According to this master plan, it is typical for groundwater systems to use a mixture of storage from reservoirs and from a basin. As shown by Cal Advocates' Table 6-3 above, the system has enough well firm capacity and purchased water capacity to meet interruptions such as the largest well going offline or an MWD outage. Therefore, GSWC does not need to build a new reservoir for emergency storage.

GSWC should not spend $6,021,000 to accommodate and build a reservoir, BPS, and field office replacement to meet self-imposed storage criteria. The South San Gabriel system meets all regulatory requirements and the strict demands of GSWC's planning scenarios. GSWC can also perform the functions of storage components with its existing supply sources. Therefore, the Commission should deny funding for the Saxon 0.75 MG reservoir, BPS, and field office replacement.

[127] GSWC Hanford and Insco Testimony, Attachment C-35 South San Gabriel System, p. 5-4.
[128] GSWC Hanford and Insco Testimony, Attachment C-35 South San Gabriel System, p. 5-3.
[129] Water System Master Plan, 11. Storage Capacity Evaluation. Sacramento Suburban Water District. http://www.sswd.org/Home/ShowDocument?id=973.

B. Saxon BPS New Construction

The Commission should deny funding for the Saxon BPS because it would only be useful to pump from GSWC's proposed Saxon Reservoir. As Cal Advocates explains in the preceding section, the new Saxon Reservoir is not needed. The new Saxon BPS therefore is also not needed.

C. Encinita New Field Office

The Commission should deny funding for the new Encinita Field Office because the existing Saxon Field Office does not need to be demolished.

To accommodate its proposed Saxon Reservoir, GSWC proposes to demolish its existing Saxon Field Office and build a new office at the Encinita Plant. In its testimony, GSWC states that the existing field office is of modular construction, has heating, ventilation, and air conditioning ("HVAC") issues, does not meet the Americans with Disabilities Act ("ADA") requirements, and has electrical equipment that has exceeded its useful life.[130] In response to discovery, GSWC stated that it is not concerned about the building's modular construction and that ADA requirements and electrical equipment issues can be addressed without a new building. GSWC also clarified that it proposes to reconstruct the building to make room for the proposed Saxon Reservoir, BPS, well and related equipment.[131] Since GSWC can address the existing Saxon Field Office's deficiencies without the construction of a new office, this project is only necessary if GSWC needs to construct the Saxon Reservoir and BPS.

GSWC should not build a new Encinita Field Office. As Cal Advocates explains in the two preceding sections, the new Saxon Reservoir and BPS are unnecessary. Therefore, there is no need for GSWC to demolish the existing Saxon Field Office to accommodate a new reservoir and no need to construct a new field office at the Encinita Plant.

[130] GSWC Hanford and Insco Testimony, p. 251, lines 17-19.
[131] Attachment 6-3, GSWC Response to Public Advocates Data Request AA9-010, Q.2.

D. Jeffries 1.25 MG Reservoir

The Commission should deny funding for the Jeffries 1.25 MG Reservoir because the South Arcadia system has enough water supply to meet its demands without a new reservoir.

To meet self-imposed storage criteria, GSWC proposes to build the 1.25 MG Jeffries Reservoir, BPS, and fencing for a total of $5,864,900. GSWC plans to spend $2,843,300 to build the 1.25 MG Jeffries Reservoir.[132] To pump water from the reservoir, GSWC also plans to spend $2,484,300 to build a BPS at the same site. Additionally, GSWC plans to spend $537,300 for fencing to secure the new facilities.

GSWC states that it should build a 1.25 MG reservoir to address a 1.24 MG storage deficiency identified in its master plan.[133] The South Arcadia Master Plan has two applicable analyses: a supply and capacity analysis and a storage analysis. GSWC's 1.24 MG storage deficiency is a result of the latter analysis. In a previous section about the Saxon 0.75 MG Reservoir, Cal Advocates discusses the differences between GSWC's two applicable analyses.

GSWC's South Arcadia system master plan, which GSWC updated in March 2020, identifies the Jeffries Reservoir and BPS as a "midterm project" in its capital improvement plan.[134] GSWC states that midterm projects are based on deficiencies beyond the short-term planning years but should not be delayed until the long-term years such as 2040.[135] GSWC's identification of the Jeffries Reservoir and BPS as a midterm project rather than a "short-term" project suggests that GSWC believes this project can be delayed in the short-term.

The California Waterworks Standards and local fire codes determine system supply deficiencies. The Waterworks Standards require that a public water system and its pressure zones always have the source capacity to meet its MDD. The South Arcadia

[132] GSWC Hanford and Insco Testimony, p. 250, line 15.
[133] GSWC Hanford and Insco Testimony, p. 250, lines 21-22.
[134] GSWC Hanford and Insco Testimony, Attachment C-34 South Arcadia Master Plan, p. 9-2.
[135] GSWC Hanford and Insco Testimony, Attachment C-24 Barstow Master Plan, p. 9-1.

system has about 7,500 connections.[136] Since the system has more than 1,000 connections, the Waterworks Standards additionally require the system and its pressure zones to meet four hours of PHD with a combination of source capacity, storage capacity, and emergency source connections. The local fire flow requirements for the South Arcadia system depend on its buildings' size and construction.[137] GSWC determined that the largest fire flow for the system's zones is 2,500 gpm for a duration of two hours.[138] The local fire flow requirements do not require that a system supply fire flow from a reservoir.

The demands of GSWC's planning scenarios are stricter than the Waterworks Standards and local fire flow requirements. GSWC's planning scenarios include, among others, when the largest capacity well is offline during the MDD and PHD, and when the largest fire flow occurs during the MDD. GSWC does not have a planning scenario for an MWD outage because the South Arcadia system does not have purchased water connections.[139] While the Waterworks Standards require that a zone be able to meet four hours of PHD from its source, storage, and emergency source capacity, GSWC's planning scenario measures whether a zone can meet four hours of PHD with its source and storage capacity when the largest well is offline. While the local fire code requires fire flow up to 2,500 gpm for two hours, GSWC's planning scenario requires its zones to simultaneously meet this fire flow and the MDD.[140]

By meeting the demands of GSWC's planning scenarios, the South Arcadia system facilities also exceed the Waterworks Standards and local fire flow requirements. According to GSWC's supply capacity analysis, the South Arcadia system zones can meet all planning scenarios.[141] Therefore, the South Arcadia system's Main zone is compliant with applicable regulatory requirements. The following table shows that the

---

[136] GSWC Hanford and Insco Testimony, Attachment C-34 South Arcadia Master Plan, p. 3-2, Table 3-1.
[137] Los Angeles County Code of Ordinances, Title 32, B105.2 and California Fire Code, Table B105.1(2). https://up.codes/viewer/california/ca-fire-code-2016/chapter/B/fire-flow-requirements-for-buildings#B.
[138] GSWC Hanford and Insco Testimony, Attachment C-34 South Arcadia Master Plan, pp. 5-7 to 5-8.
[139] GSWC Hanford and Insco Testimony, Attachment C-34 South Arcadia Master Plan, p. 2-3.
[140] GSWC Hanford and Insco Testimony, Attachment C-34 South Arcadia Master Plan, p. 5-2.
[141] GSWC Hanford and Insco Testimony, Attachment C-34 South Arcadia Master Plan, pp. 5-7 to 5-8.

Main zone can meet its planning scenario demands without additional storage. Although the table shows that the system draws on the existing 1.0 MG reservoir, the existing reservoir is refilled by its own 1,000 gpm well.[142] The well can therefore quickly replace the stored water that the system draws from the reservoir in the scenarios below.

**Table 6-5: Cal Advocates Supply and Capacity Analysis – South Arcadia**

**Main Zone**

| | (A) | (B) Capacity | (C) Largest Well Offline During MDD | (D) Largest Well Offline During PHD | (E) Largest Fire Flow During MDD |
|---|---|---|---|---|---|
| 1 | Duration (Hours) | | 24 | 4 | 2 |
| 2 | Units | (gpm) | (gpm) | (gpm) | (gpm) |
| 3 | Demand | | | | |
| 4 | Main Zone | | 3,711 | 5,566 | 6,211 |
| 5 | Transfer to Gidley Zone | | 206 | 309 | 206 |
| 7 | **Total Demand** | | **3,917** | **5,875** | **6,417** |
| 8 | Supply | | | | |
| 9 | Wells (total capacity) | 6,200 | -- | -- | 6,200 |
| 10 | Wells (firm capacity) | 4,900 | 3,917 | 4,900 | -- |
| 11 | Reservoir (via boosters) | 3,200 | 0 | 975 | 217 |
| 12 | Reservoir Storage Used (MG) | 1.0 | 0 | 0.23 | 0.05 |
| 13 | **Total Supply** | | **3,917** | **5,875** | **2,622** |
| **14** | **Supply Meets Demand?** | | **Yes** | **Yes** | **Yes** |

Unlike the above analysis, GSWC's separate "storage analysis" examines water supplied by reservoirs specifically. GSWC states that it considered standards published by AWWA to develop its storage-only criteria. In the publication that GSWC provided, AWWA explains that sizing reservoirs requires a detailed analysis of water demands, supply sources, and the distribution system. AWWA, therefore, recognizes that systems that are sizing reservoirs should account for the system's supply sources.

[142] GSWC Hanford and Insco Testimony, Attachment C-34 South Arcadia Master Plan, p. 5-7, Table 5-7.

GSWC's storage analysis has three components: operational, fire, and emergency storage. GSWC intends the operational component to regulate the difference between the rate of supply and the daily rate of usage. When usage is greater than well supply, the system can draw from operational storage. When well supply exceeds usage, the wells can refill the operational storage. The fire component would provide up to the largest fire flow in each zone. The emergency component would provide a backup supply during a major source interruption. GSWC calculates its storage deficiency from these components according to the table below:[143]

**Table 6-6 GSWC Storage Analysis – South Arcadia Main Zone**

| | (A)<br>Component | (B)<br>Storage Volume (MG) |
|---|---|---|
| 1 | Operational Storage | 0.45 |
| 2 | Fire Storage | 0.30 |
| 3 | Emergency Storage | 1.40 |
| 4 | **Total Recommended Storage** | **2.14** |
| 5 | Available Storage | 0.90 |
| **7** | **Available Storage - Total Recommended Storage** | **-1.24** |

GSWC's existing supply sources can perform the functions of the storage components above. As an alternative to operational storage, GSWC can install VFDs to its well pumps. VFDs control a pump's rate of supply to the desired output. Since VFDs regulate the difference between supply and usage, operational storage can be reduced. GSWC has already installed VFDs on three of its largest wells in the system's Main zone.[144] GSWC can provide fire flow from a combination of wells and an existing reservoir. As shown by Table 6-5 above, the Main zone wells and existing reservoir will be able to simultaneously supply the MDD and largest fire flow of 2,500 gpm.

GSWC also does not need reservoirs to provide emergency supply. In case of a source interruption, a system can provide backup supply from an independent source, a

[143] GSWC Hanford and Insco Testimony, Attachment C-34 South Arcadia Master Plan, p. 5-10, Tables 5-10 and 5-11.
[144] GSWC Hanford and Insco Testimony, Attachment C-34 South Arcadia Master Plan, Figure 2-2.

reservoir, or a combination of both. GSWC states that industry standards for emergency storage range from 12 to 24 hours ADD. GSWC decides that an emergency storage component equal to 12 hours of ADD is appropriate because the South Arcadia system has multiple sources and an existing reservoir.[145] The industry standards that GSWC refers to do not appear in the AWWA publication that GSWC provided. Even if other publications do recommend a specific emergency storage amount, water systems can provide this storage from groundwater basins. For example, a master plan from the Sacramento Suburban Water District assumes that wells will pump all of its emergency storage from the basin. According to this master plan, it is typical for groundwater systems to use a mixture of storage from reservoirs and from a basin. As shown by Cal Advocates' Table 6-5 above, the system has enough well firm capacity and purchased water capacity to meet interruptions such as the largest well going offline. Therefore, GSWC does not need to build a new reservoir for emergency storage.

GSWC should not spend $5,864,900 to accommodate and build a reservoir, BPS, and fencing to meet self-imposed storage criteria. The South Arcadia system meets all regulatory requirements and the strict demands of GSWC's planning scenarios. GSWC can also perform the functions of storage components with its existing supply sources. Therefore, the Commission should deny funding for the Jeffries 1.25 MG reservoir, BPS, and fencing.

### E. Jeffries BPS New Construction

The Commission should deny funding for the Jeffries BPS because it would only be useful to pump from GSWC's proposed Jeffries Reservoir. As Cal Advocates explains in the preceding section, a new Jeffries Reservoir is not needed.

### F. Jeffries Fencing

[145] GSWC Hanford and Insco Testimony, Attachment C-34 South Arcadia Master Plan, p. 5-10, Tables 5-10 and 5-11.

The Commission should deny funding for the Jeffries Fencing because GSWC's proposed Jeffries Reservoir and BPS are unnecessary.

GSWC states that the Jeffries Plant site is currently enclosed by a 6-foot-tall wooden fence with a chain-link gate. GSWC further states that the wooden fence would not provide enough security for the new storage and water treatment facilities.[146] The only water treatment facility that GSWC proposes for the Jeffries site is a replacement for the site's chemical building.[147] However, the existing building is secured by an inner chain-link fence in addition to the site's wooden fence. Since there is no need for the Jeffries Reservoir and BPS, GSWC does not need to further secure the site's entire 858-foot perimeter with tubular steel fencing.[148]

GSWC should not install new fencing at the Jeffries Plant site. As Cal Advocates explains in the two preceding sections, the new Jeffries Reservoir and BPS are unnecessary. Therefore, there is no need for GSWC to further secure the Jeffries Plant site with new fencing.

## IV. Conclusion

The Commission should adjust GSWC's estimated capital budget for non-pipeline projects in the San Gabriel Valley CSA. Specifically, the Commission should

- Deny funding in rates for the new Saxon 0.75 MG Reservoir and BPS because the South San Gabriel system has enough water supply to meet its demands without a new reservoir.
- Deny funding for the new Encinita Field Office because the existing Saxon Field Office does not need to be demolished.

[146] GSWC Hanford and Insco Testimony, p. 249, 11-13.
[147] Rate Base Workpapers, Capital, PCEs, file "PCE_RIII – South Arcadia (Jeffries Plant, Construct Booster Station).xlsx," tab "Construction Cost," rows 25-27.
[148] Rate Base Workpapers, Capital, PCEs, file "PCE_RIII – South Arcadia (Jeffries Plant, Fencing Improvements).xlsx," tab "Construction Cost," row 14.

- Deny funding for the Jeffries 1.25 MG Reservoir, BPS, and fencing because the South Arcadia system has enough water supply to meet its demands without a new reservoir.
- Adjust the project estimates for the remaining projects consistent with the Cal Advocates' contingency and escalation factors recommendations in Chapter 1 of this testimony.

# CHAPTER 7: BARSTOW CSA

## I. Introduction

This chapter provides Cal Advocates' recommended adjustments to GSWC's non-pipeline capital projects for the Barstow CSA. The Barstow CSA is composed of the Barstow system.

## II. Summary of Recommendations

The table below summarizes GSWC's and Cal Advocates' recommended capital budgets for non-pipeline projects by year.

**Table 7-1: Non-Pipeline Capital Budget – Barstow CSA**

| | (A) Description | (B) 2021 | (C) 2022 | (D) 2023 |
|---|---|---|---|---|
| 1 | GSWC | $4,117,300 | $5,618,800 | $8,161,600 |
| 2 | Cal Advocates | $4,040,300 | $4,912,800 | $6,043,000 |
| 3 | GSWC > Cal Advocates | $77,000 | $706,000 | $2,118,600 |
| 4 | Cal Advocates as % of GSWC | 95% | 87% | 74% |

The table below compares GSWC's and Cal Advocates' recommended capital budgets for non-pipeline projects by project description.

**Table 7-2: Non-Pipeline Capital Projects – Barstow CSA**

| | (A) Description | (B) Year | (C) GSWC | (D) Cal Advocates | (E) GSWC > Cal Advocates | (F) Cal Advocates as % of GSWC |
|---|---|---|---|---|---|---|
| 1 | Brine Waste Disposal Feasibility Study Phase I | 2021 | $268,200 | $254,800 | $13,400 | 95% |
| 2 | Brine Waste Disposal Feasibility Study Phase II | 2022 | $2,337,400 | $2,205,400 | $132,000 | 94% |
| 3 | Barstow, Chlorine Analyzers | 2023 | $920,000 | $862,500 | $57,500 | 94% |
| 4 | Lenwood Reservoir, Retrofit | 2021 | $628,800 | $597,400 | $31,400 | 95% |
| 5 | Bear Valley Phase 3 | 2023 | $3,896,500 | $2,759,300 | $1,137,200 | 71% |
| 6 | Region III SCADA (2021) | 2021 | $3,220,300 | $3,188,100 | $32,200 | 99% |
| 7 | Region III SCADA (2022) | 2022 | $3,281,400 | $2,707,400 | $574,000 | 83% |
| 8 | Region III SCADA (2023) | 2023 | $3,345,100 | $2,421,200 | $923,900 | 72% |

Cal Advocates' recommended capital budget is the result of the following adjustments:

- The Commission should adjust funding for the Bear Valley Plant Phase 3 because a new pump building is not needed.
- The Commission should adjust funding for the SCADA upgrades consistent with GSWC's revised project cost estimates.
- The Commission should adjust the project estimates for the remaining projects consistent with the Cal Advocates' contingency and escalation factors recommendations in Chapter 1 of this testimony.

## III. **Discussion**

A. Bear Valley Plant Phase 3

The Commission should adjust funding for the Bear Valley Plant Phase 3 because a new pump building is not needed.

GSWC plans to spend $3,896,500 in 2023 to replace the four existing Bear Valley Plant booster pumps, build a new pump building, install a permanent generator, and replace the motor control center ("MCC") and programmable logic controller ("PLC"). GSWC proposes to replace the four booster pumps because of their age and design capacity. GSWC proposes to install the replacement MCC and PLC in the new pump building.[149] GSWC currently operates two of the four booster pumps out in the open and the other two in a 180 SF building.[150] GSWC, however, proposes to construct a 1,200 SF pump building to house the Bear Valley booster pumps, MCC, and PLC.[151]

There is no need for a new pump building for the Bear Valley BPS. In response to discovery, GSWC explained that the new Bear Valley booster pumps will be vertical turbine pumps that will require an access hatch in the pump building's roof for maintenance. GSWC further explained that it would have to dismantle the existing building's roof to access the proposed booster pumps.[152] Instead, GSWC proposes to replace the existing pump building. GSWC can, however, alternatively operate the four proposed booster pumps in the open. Two of the existing pumps currently operate in the open. With the booster pumps in the open, GSWC will be able to provide maintenance without dismantling the pump building roof or installing an access hatch. For the similar Concerto BPS and Indian Hill North BPS projects, GSWC stated that it proposes buildings to reduce pump noise from affecting neighboring homes. Nevertheless, there

[149] GSWC Hanford and Insco Testimony, p. 264.
[150] Attachment 7-1, Bear Valley Booster Pump Station Photographs.
[151] GSWC Rate Base Workpapers, Capital, PCEs, file "PCE_RIII – Barstow (Bear Valley Phase 3).xlsx," tab "Construction Cost," row 17.
[152] Attachment 7-2, GSWC Response to Public Advocates Data Request AA9-013, Q.1a.

are no recorded noise complaints that can substantiate a noise problem at the Bear Valley BPS.[153]

Cal Advocates' recommended adjustments to contingency and escalation reduce the total estimate for the Bear Valley Plant Phase 3 project to $3,652,700. Removing the new pump building further reduces the project cost estimate to $2,759,300. Removing the pump building would therefore save $893,400 in upfront capital costs.[154]

GSWC should not construct a pump building to house the pump replacement. The Commission should adjust funding by removing the pump building from the cost estimate. Cal Advocates removed the pump building in the recommended capital budgets in Table 7-1 and 7-2 above.

### B. SCADA Upgrades

The Commission should adjust funding for the SCADA upgrades consistent with GSWC's revised project cost estimates and Cal Advocates' contingency and escalation factors recommendations.

GSWC revised the SCADA upgrades project cost estimates during discovery. GSWC's revised estimates are higher in 2021, but lower in 2022 and 2023.[155] However, after applying Cal Advocates contingency and escalation factors adjustment, the resulting 2021 cost estimate, $3,188,100, is less than GSWC's estimate in its application, $3,220,300. Therefore, the Commission should adjust funding for the SCADA upgrades to $3,188,100 in 2021, $2,707,400 in 2022, and $2,421,200 in 2023.

## IV. Conclusion

The Commission should adjust GSWC's estimated capital budget for non-pipeline projects in the Barstow CSA. Specifically, the Commission should:

---

[153] Attachment 3-6, GSWC Response to Public Advocates Data Request AA9-017, Q.1c.
[154] $\$3,652,700 - \$2,759,300 = \$893,400.$
[155] Attachment 7-3, GSWC Response to Public Advocates Data Request JMI-009, Q.1.

- Adjust funding for the Bear Valley Plant Phase 3 because a new pump building is not needed.
- Adjust funding for the SCADA upgrades consistent with GSWC's revised project cost estimates.
- Adjust the project estimates for the remaining projects consistent with the Cal Advocates' contingency and escalation factors recommendations in Chapter 1 of this testimony.

# CHAPTER 8: CALIPATRIA CSA

## I. Introduction

This chapter provides Cal Advocates' recommended adjustments to GSWC's non-pipeline capital projects for the Calipatria CSA. The Calipatria CSA is composed of the Calipatria-Niland system.

## II. Summary of Recommendations

The table below summarizes GSWC's and Cal Advocates' recommended capital budgets for non-pipeline projects by year.

**Table 8-1: Non-Pipeline Capital Budget – Calipatria CSA**

| | (A) Description | (B) 2021 | (C) 2022 | (D) 2023 |
|---|---|---|---|---|
| 1 | GSWC | $745,000 | $211,700 | $0 |
| 2 | Cal Advocates | $707,900 | $200,100 | $0 |
| 3 | GSWC > Cal Advocates | $37,100 | $11,600 | $0 |
| 4 | Cal Advocates as % of GSWC | 95% | 95% | N/A |

The table below compares GSWC's and Cal Advocates' recommended capital budgets for non-pipeline projects by project description.

**Table 8-2: Non-Pipeline Capital Projects – Calipatria CSA**

| | (A) Description | (B) Year | (C) GSWC | (D) Cal Advocates | (E) GSWC > Cal Advocates | (F) Cal Advocates as % of GSWC |
|---|---|---|---|---|---|---|
| 1 | Holabird, Plant Upgrades | 2021 | $745,000 | $707,900 | $37,100 | 95% |
| 2 | Holabird, Grounding Improvements | 2022 | $211,700 | $200,100 | $11,600 | 95% |

Cal Advocates' recommended capital budget is the result of the following adjustment:

- The Commission should adjust the project estimates for the remaining projects consistent with the Cal Advocates' contingency and escalation factors recommendations in Chapter 1 of this testimony.

## III. Discussion

Cal Advocates does not recommend further adjustments to the Calipatria CSA's non-pipeline projects.

## IV. Conclusion

The Commission should adjust GSWC's estimated capital budget for non-pipeline projects in the Calipatria CSA consistent with the Cal Advocates' contingency and escalation factors recommendations.

# CHAPTER 9: MORONGO VALLEY CSA

## I. Introduction

This chapter provides Cal Advocates' recommended adjustments to GSWC's non-pipeline capital projects for the Morongo Valley CSA. The Morongo Valley CSA is composed of the Morongo Del Norte and Morongo Del Sur systems.

## II. Summary of Recommendations

The table below summarizes GSWC's and Cal Advocates' recommended capital budgets for non-pipeline projects by year.

**Table 9-1: Non-Pipeline Capital Budget – Morongo Valley CSA**

| | (A) Description | (B) 2021 | (C) 2022 | (D) 2023 |
|---|---|---|---|---|
| 1 | GSWC | $1,134,600 | $986,500 | $0 |
| 2 | Cal Advocates | $1,077,100 | $219,500 | $0 |
| 3 | GSWC > Cal Advocates | $57,500 | $767,000 | $0 |
| 4 | Cal Advocates as % of GSWC | 95% | 22% | N/A |

The table below compares GSWC's and Cal Advocates' recommended capital budgets for non-pipeline projects by project description.

**Table 9-2: Non-Pipeline Capital Projects – Morongo Valley CSA**

| | (A) Description | (B) Year | (C) GSWC | (D) Cal Advocates | (E) GSWC > Cal Advocates | (F) Cal Advocates as % of GSWC |
|---|---|---|---|---|---|---|
| 1 | Highway Well, Uranium Treatment | 2022 | $754,300 | $0 | $754,300 | 0% |
| 2 | Morongo Del Norte, Chlorine Analyzers | 2022 | $92,500 | $87,400 | $5,100 | 95% |
| 3 | Navajo Booster Station, Booster Pump, Electrical and Piping | 2021 | $1,134,600 | $1,077,100 | $57,500 | 95% |
| 4 | Morongo Del Sur, Chlorine Analyzers | 2022 | $139,700 | $132,100 | $7,600 | 95% |

Cal Advocates' recommended capital budget is the result of the following adjustments:

- The Commission should deny funding in rates for Highway Uranium Treatment Plant because the Morongo Del Norte system already has reliable water supply.
- The Commission should adjust the project estimates for the remaining projects consistent with the Cal Advocates' contingency and escalation factors recommendations in Chapter 1 of this testimony.

## III. Discussion

### A. Highway Uranium Treatment Plant

The Commission should deny funding in rates for the Highway Uranium Treatment Plant because the Morongo Del Norte system already has reliable water supply. Cal Advocates also recommends adjusting funding in rates for a related uranium treatment project at the Morongo Del Norte system's Elm Well in Cal Advocates' Report and Recommendations on Construction-Work-in-Progress and Special Request 7.[156]

GSWC plans to spend $754,300 in 2022 to install treatment for uranium at the Highway Well. To treat the Highway Well for uranium, GSWC would install a package treatment plant inside a metal building at the site.[157]

The Commission previously authorized funding in rates for the Elm Well treatment system to ensure water supply in the Morongo Del Norte system should the Highway Well's uranium concentration exceed the MCL. In GSWC's 2014 GRC, the Commission approved funding in rates for a uranium removal system at the Elm Well, one of three wells in the Morongo Del Norte system. The Elm Well had a uranium concentration above the MCL. The Commission reasoned that the Elm Well's treatment system would ensure enough supply should either of the two other system wells become contaminated with uranium.[158]

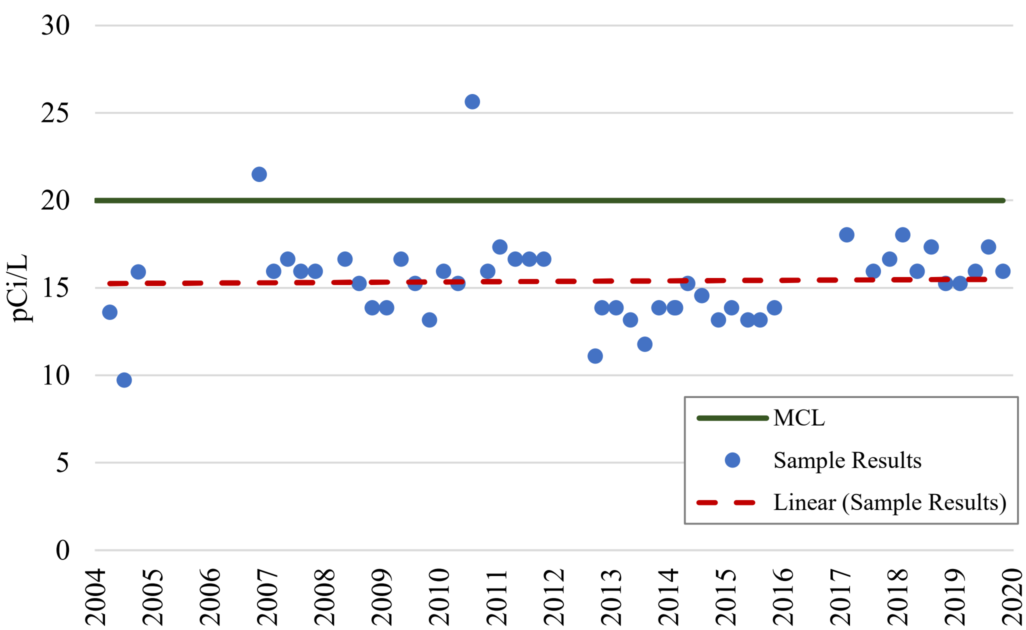
The Morongo Del Norte system is reliable without installing a uranium treatment plant at the Highway Well. In response to discovery, GSWC stated that the treatment system at the Elm Well will be placed into service in the first quarter of 2021.[159] When active, the Morongo Del Norte system will have three active wells. The Elm, Bella Vista, and Highway wells have capacities of 90, 100, and 100 gpm, respectively. Each well has the capacity to individually meet the system's MDD of 87 gpm.[160] According to GSWC's supply and capacity analysis, the system can meet the PHD and the largest fire flow during MDD planning scenarios with a combination of water from wells and the Navajo Reservoir.[161] The Morongo Del Norte system therefore has reliable supply should GSWC take the Highway Well offline.

---

[156] Cal Advocates Report and Recommendations on Construction-Work-in-Progress and Special Request 7, pp. 69-73.
[157] GSWC Hanford and Insco Testimony, p. 285, line 11.
[158] D.16-12-067, p. 93.
https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M171/K508/171508968.pdf#page=103.
[159] Attachment 9-1, GSWC Response to Public Advocates Data Request AA9-003, Q.2.b.
[160] GSWC Hanford and Insco Testimony, Attachment C-30 Morongo Del Norte Master Plan, pp. 2-2, 2-3, and 3-5.
[161] GSWC Hanford and Insco Testimony, Attachment C-30 Morongo Del Norte Master Plan, p. 5-8.

Whether the Highway Well's uranium concentration will exceed the MCL in the future is unknown at this time. The MCL for uranium is 20 picocuries per liter ("pCi/L").[162] GSWC states that the Highway Well's water has averaged 15 pCi/L for the last six years. GSWC further states that the uranium concentration is "trending up."[163] Based on all sample results that GSWC provided, there is no long-term upward trend since 2004. The figure below shows the sample concentrations that GSWC provided. The trend, represented by a dashed line in the figure below, is nearly flat at 15 pCi/L.

**Figure 9-1: Highway Well Uranium Sample Concentration 2004-2019**

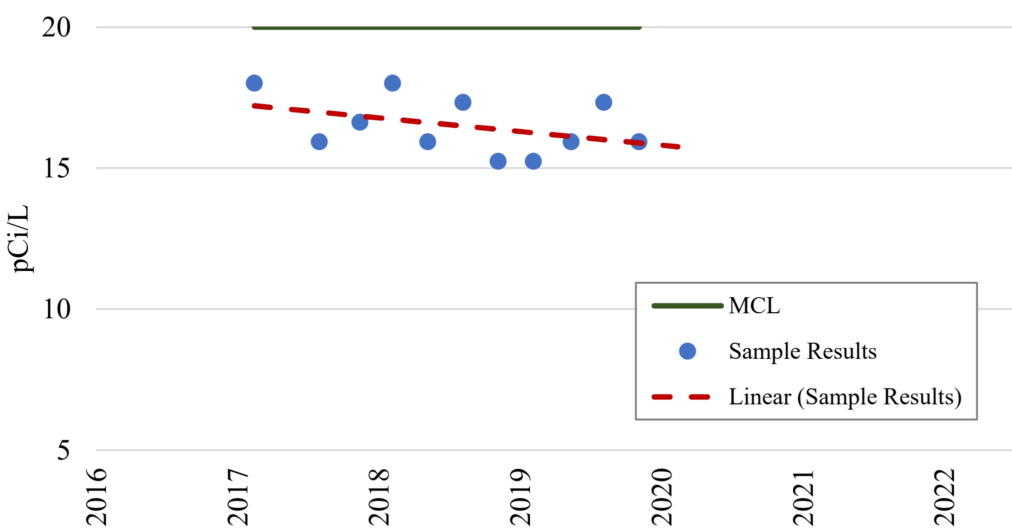



The most recent years, 2017-2019, in the Highway Well's sample results show a downward trend. GSWC did not provide uranium sample results for the year 2016. However, between 2017 and 2019, GSWC reports sample results for nearly all consecutive quarters.[164] During these years, the sample results show a downward trend

[162] California Code of Regulations, Title 22, §64442. https://govt.westlaw.com/calregs/Document/I29898BC27579472F89C1ABEB9C3E842A?contextData=%28sc.Default%29&transitionType=Default.
[163] GSWC Hanford and Insco Testimony, p. 285, line 19.
[164] Attachment 9-2, GSWC Response to Public Advocates Data Request AA9-003, Attachment Q.4a "Revised MV01 – Highway Well Ur Lab Results."

back toward 15 pCi/L. The figure below represents this recent downward trend as a dashed line. The long-term flat trend and the recent downward trend do not predict that the Highway Well's uranium concentration will exceed the MCL.

**Figure 9-2: Highway Well Uranium Sample Concentration 2017-2019**




The Commission should deny funding for the Highway Uranium Treatment Plant. In authorizing funding for the Elm Well's treatment system, the Commission addressed the Morongo Del Norte system's reliability. The Commission reasoned that the Elm Well's treatment system would ensure enough water supply should the Highway Well's water exceed the MCL for uranium. Based on the sample results provided by GSWC, the Highway Well's long-term trend is nearly flat and the most recent 2017-2019 trend is downward. Therefore, whether the Highway Well's uranium concentration will exceed the MCL is unknown.

## IV. Conclusion

The Commission should adjust GSWC's estimated capital budget for non-pipeline projects in the Morongo Valley CSA. Specifically, the Commission should:

- Deny funding in rates for Highway Uranium Treatment Plant because the Morongo Del Norte system already has reliable water supply.

- Adjust the project estimates for the remaining projects consistent with the Cal Advocates' contingency and escalation factors recommendations in Chapter 1 of this testimony.

# CHAPTER 10: APPLE VALLEY CSA

## I. Introduction

This chapter provides Cal Advocates' recommended adjustments to GSWC's non-pipeline capital projects for the Apple Valley CSA. The Apple Valley CSA is composed of the Apple Valley North, Apple Valley South, Lucerne, and Desert View systems.

## II. Summary of Recommendations

The table below summarizes GSWC's and Cal Advocates' recommended capital budgets for non-pipeline projects by year.

**Table 10-1: Non-Pipeline Capital Budget – Apple Valley CSA**

| | (A) Description | (B) 2021 | (C) 2022 | (D) 2023 |
|---|---|---|---|---|
| 1 | GSWC | $342,800 | $147,000 | $471,600 |
| 2 | Cal Advocates | $325,600 | $138,900 | $443,300 |
| 3 | GSWC > Cal Advocates | $17,200 | $8,100 | $28,300 |
| 4 | Cal Advocates as % of GSWC | 95% | 94% | 94% |

The table below compares GSWC's and Cal Advocates' recommended capital budgets for non-pipeline projects by project description.

**Table 10-2: Non-Pipeline Capital Projects – Apple Valley CSA**

| | (A) Description | (B) Year | (C) GSWC | (D) Cal Advocates | (E) GSWC > Cal Advocates | (F) Cal Advocates as % of GSWC |
|---|---|---|---|---|---|---|
| 1 | Apple Valley North, Chlorine Analyzers | 2023 | $94,900 | $89,200 | $5,700 | 94% |
| 2 | Apple Valley South, Chlorine Analyzers | 2023 | $189,800 | $178,400 | $11,400 | 94% |
| 3 | Desert View, Chlorine Analyzers | 2023 | $101,800 | $95,700 | $6,100 | 94% |
| 4 | Desert View, Land Acquisition | 2021 | $342,800 | $325,600 | $17,200 | 95% |
| 5 | Lucerne, Destroy Pawnee Well | 2023 | $85,100 | $80,000 | $5,100 | 94% |
| 6 | Lucerne, Chlorine Analyzers | 2022 | $147,000 | $138,900 | $8,100 | 95% |

Cal Advocates' recommended capital budget is the result of the following adjustment:

- The Commission should adjust the project estimates consistent with the Cal Advocates' contingency and escalation factors recommendations in Chapter 1 of this testimony.

## III. Discussion

Cal Advocates does not recommend further adjustments to the Apple Valley CSA's non-pipeline projects.

## IV. Conclusion

The Commission should adjust GSWC's estimated capital budget for non-pipeline projects in the Apple Valley CSA consistent with the Cal Advocates' contingency and escalation factors recommendations.

# CHAPTER 11: WRIGHTWOOD CSA

## I. Introduction

This chapter provides Cal Advocates' recommended adjustments to GSWC's non-pipeline capital projects for the Wrightwood CSA. The Wrightwood CSA is composed of the Wrightwood system.

## II. Summary of Recommendations

The table below summarizes GSWC's and Cal Advocates' recommended capital budgets for non-pipeline projects by year.

**Table 11-1: Non-Pipeline Capital Budget – Wrightwood CSA**

| | (A) Description | (B) 2021 | (C) 2022 | (D) 2023 |
|---|---|---|---|---|
| 1 | GSWC | $1,107,300 | $2,840,000 | $0 |
| 2 | Cal Advocates | $1,051,200 | $2,680,100 | $0 |
| 3 | GSWC > Cal Advocates | $56,100 | $159,900 | $0 |
| 4 | Cal Advocates as % of GSWC | 95% | 94% | N/A |

The table below compares GSWC's and Cal Advocates' recommended capital budgets for non-pipeline projects by project description.

**Table 11-2: Non-Pipeline Capital Projects – Wrightwood CSA**

| | (A) Description | (B) Year | (C) GSWC | (D) Cal Advocates | (E) GSWC > Cal Advocates | (F) Cal Advocates as % of GSWC |
|---|---|---|---|---|---|---|
| 1 | Destroy Buford Canyon Well No. 2 | 2021 | $104,300 | $99,100 | $5,200 | 95% |
| 2 | Wrightwood, Chlorine Analyzers | 2022 | $370,100 | $349,700 | $20,400 | 95% |
| 3 | Sheep Creek Reservoir | 2022 | $2,469,900 | $2,330,400 | $139,500 | 94% |
| 4 | Fire Hardening | 2021 | $1,003,000 | $952,100 | $50,900 | 95% |

Cal Advocates' recommended capital budget is the result of the following adjustment:

- The Commission should adjust the project estimates consistent with the Cal Advocates' contingency and escalation factors recommendations in Chapter 1 of this testimony.

## III. Discussion

Cal Advocates does not recommend further adjustments to the Wrightwood CSA's non-pipeline projects.

## IV. Conclusion

The Commission should adjust GSWC's estimated capital budget for non-pipeline projects in the Wrightwood CSA consistent with the Cal Advocates' contingency and escalation factors recommendations.

# ATTACHMENT 1-1: STATEMENT OF QUALIFICATIONS

# STATEMENT OF QUALIFICATIONS – ANTHONY ANDRADE

Q1. Please state your name, business address, and position with the California Public Utilities Commission ("Commission").

A1. My name is Anthony Andrade and my business address is 320 West 4th Street, Suite 500, Los Angeles, California 90013. I am a Utilities Engineer in the Water Branch of the Public Advocates Office.

Q2. Please summarize your education background and professional experience.

A2. I received a Bachelor of Science Degree in Mechanical Engineering from the University of California--Riverside in 2018.

I have been with the Public Advocates Office – Water Branch since October 2018.

Q3. What is your responsibility in this proceeding Golden State Water Company GRC A.20-07-012?

A3. I am responsible for the Report and Recommendations on Region 3 Plant, Contingency, and Plant Escalation for the Golden State Water Company general rate case test year 2022.

Q4. Does this conclude your prepared direct testimony?

A4. Yes, it does.

**ATTACHMENT 1-2: A.14-07-006, GSWC PREPARED TESTIMONY OF ROBERT MCVICKER AND MARK INSCO, PP. 14-16**

Permitting costs are comprised of the cost of meeting with permitting agencies, preparation of permit application documents, reviews of permit submittals, permit fees and attendance at community meetings and public hearings. As environmental regulations and local ordinances become increasingly more stringent, the permitting process has required more time and resources to complete. The design costs included in the engineering cost estimate includes both preliminary and final design of projects, design reviews, project meetings and project management. The costs for engineering activities during the construction phase of a project include shop drawing reviews, inspections, change order reviews, construction issues review, as-built preparation, project management and meetings.

Due to the lead time needed to go through the permitting process, some projects in GSWC's capital budget have a two or three-year planning schedule. For these projects, the first year, which is labeled 'Phase I' or 'Design', includes cost for design and permitting. The second (and/or third) year, which is labeled 'Phase II' or 'Construction', includes the construction costs and construction engineering costs.

(Q) Do your cost estimates include a contingency?

(A) Yes. Within the construction and water industries the use of contingency is standard practice in developing cost estimates and is defined by the Association for the Advancement of Cost Engineering (AACE) as "a cost element of an estimate to cover a statistical probability of the occurrence of unforeseeable elements of cost within the defined project scope due to a combination of uncertainties, intangibles, and unforeseen/highly unlikely occurrences of future events, based on a management decisions to assume certain risks (for the occurrence of those events)."[6] This issue

[6] Attachment 6 – Contingency and Capital Cost Estimates, Zaheer, March 1995

further states "Contingency reflects a management judgmental allowance to avoid the project cost overruns (within the parameters of risks assumed) to ensure that the owner is not required to reappropriate additional funds. At the same time, contingency should not be to too high to create a 'fat' estimate." This report then goes on to provide a range for the accuracy range for the various types of Capital Cost Estimates and indicates an accuracy range for a Budget Estimate is "+30% to -5%".

(Q) Is contingency simply a 'slush fund' to cover costs associated with inadequate planning and poor design?

(A) No. Contingency is an element of a cost estimate to cover the statistical probability of the occurrence of unforeseeable elements of cost within the designed project scope due to a combination of uncertainties, intangibles, and unforeseen/highly unlikely occurrences.

(Q) How are *risk* and *probability* related to *contingency*?

(A) *Contingency* is an inverse function of *risk*, where *risk* is assessed by the *probability* of the occurrence of uncertainties, intangibles and unforeseen events. By virtue of the above definition, contingency is associated with the levels of risk deemed acceptable by a company, i.e.:

- The greater the risk undertaken for probability of events to occur, the lower the amount of contingency required; and
- The lower the risk undertaken for probability of events to occur, the greater the amount of contingency required.

(Q) Are contingency and cost overrun the same thing?

(A) No. Contingency and cost overruns are not one in the same. In fact, contingency and cost overruns are actually inversely proportional and the greater the contingency, say 30%, the less likely GSWC would expect to incur a cost overrun. Conversely, a contingency of 0% is much more likely to result in a large cost overrun.

(Q) What percent contingency does GSWC utilize and why?

(A) GSWC's uses a 10% contingency within its proposed budget estimates for capital projects. This figure is not only standard practice within the industry, it is also prudent and in the best interest of the rate payers, as a 10% contingency is a fair balance between the risk of unforeseen events and an overly-conservative budget.

(Q) Do you have testimony to support the GSWC pipeline projects?

(A) Yes. The projects are listed below:

**<u>GIS Project</u>**

(Q) Why do you need a GIS Project?

(A) Our current process to convert AutoCAD base maps to GIS using existing GSWC staff is very time consuming and with 38 systems to convert will take several years to accomplish. GSWC has identified numerous benefits that can be attained through the use of GIS. Without the GIS Project, GSWC will have to forgo these benefits. Without the GIS Project, GSWC will quickly fall further behind the industry standard of other water suppliers by not having a fully functional GIS.

**ATTACHMENT 1-3: GSWC RESPONSE TO PUBLIC ADVOCATES DATA REQUEST AA9-008, ATTACHMENT AA9-008 Q.1**

AA9-008

State of California Public Utilities Commission, San Francisco

***MEMORANDUM***

Date : February 11, 2020

To : R. Smith, Program Manager, Public Advocates Office; R. Kahlon, Director, Water Division

From : M. Kanter, Regulatory Analyst, Public Advocates Office Energy Cost of Service & Natural Gas Branch
J. Montero, Regulatory Analyst, Public Advocates Office Communications & Water Policy Branch

File No. : S-2559

Subject: Public Advocates Office January 2020 Summary of Compensation Per Hour

The following data are provided to Commission water utilities staff to enable them to utilize Public Advocates Office composite non-labor escalation methodology. The numbers are to be used in conjunction with the non-labor factors provided in Public Advocates Office monthly escalation memorandum to bring historic dollars to base year dollars and to inflate recorded dollars to test year levels. The annual change in Compensation per Hour is applicable to contracted services, while the non-labor factor is related to material and supply purchases. In accordance with a 1991 agreement between the CPUC Water Division and the California Water Association (CWA), the monthly non-labor rate is to be weighted by 60 percent and the Compensation per Hour Index weighted 40 percent. If you have any questions regarding the application of these factors, please contact me.

**COMPENSATION PER HOUR**
Annual Rate of Change
Non-farm Business Sector, Seasonally Adjusted

| Year | Annual Change |
|---|---|
| 2009 | 0.9% |
| 2010 | 1.9% |
| 2011 | 2.2% |
| 2012 | 2.6% |
| 2013 | 1.3% |
| 2014 | 2.8% |
| 2015 | 3.1% |
| 2016 | 1.1% |
| 2017 | 3.5% |
| 2018 | 3.1% |
| 2019 | 3.7% |
| 2020 | 3.0% |
| 2021 | 3.7% |
| 2022 | 4.1% |
| 2023 | 4.3% |
| 2024 | 4.2% |

Source: IHS Global Insight January 2020 U.S. Economic Outlook

**All above data provided by Public Advocates Office are subject to limited access on an as-needed basis.**

**ATTACHMENT 2-1: GSWC RESPONSE TO PUBLIC ADVOCATES DATA REQUEST AA9-014**

Golden State
Water Company
A Subsidiary of American States Water Company

November 6, 2020

Anthony Andrade, Public Advocates Office
**CALIFORNIA PUBLIC UTILITIES COMMISSION**
505 Van Ness Avenue
San Francisco, CA 94102

Subject: Data Request AA9-014 (A.20-07-012)
Ball Plant Treatment II Response
Due Date: November 6, 2020

Dear Anthony Andrade,

In response to the above referenced data request number, we are pleased to submit the following responses:

**Question 1:**
Does GSWC monitor iron at Ball Road Well? If yes, please provide the iron monitoring results for Ball Road Well from 2016-2019.

**Response 1:**
Yes, please see the attached file "Q1. Ball Road Well 1 Iron (2016-2019).pdf" for iron monitoring results.

**Question 2:**
In "Hanford and Insco Operating District Capital Testimony," pages 191-192, GSWC states its plans to acquire land and install an iron and manganese removal system for Ball Road Well. On page 191, lines 14-15, GSWC states that the West Orange system "receives dirty water complaints in the area served by the source."

a. What is the area served by Ball Road Well?
b. Is Ball Road Well the only source serving the area defined in Q.2.a?
c. How many customer connections are in the area served by Ball Road Well?

d. How does GSWC determine that dirty water complaints are made in the area served by Ball Road Well?
e. Are the complaint totals that GSWC provided in its Response to Public Advocates Data Request AA9-002, Q.3.a Attachment LA02 for the entire West Orange system?
f. If yes to Q.2.e, please complete the table below by providing the discolored water complaint totals that are made in the area served by Ball Road Well.

| Year | 2017 | 2018 | 2019 |
|---|---|---|---|
| Number of Complaints | | | |

**Response 2:**

a. Please see the attached file "Q2.a West Orange System (Ball Rd Well Zone of Influence).pdf". Please note the zone of influence is estimated from occurrences of discolored water at sample stations. However, distribution of the groundwater from Ball Road Well No. 1 could be influenced by system demands and sources of supply.
b. No it is not.
c. Approximately 15,000 service connections are within the Ball Road Well service area.
d. We determined this by mapping all customer complaints based on their address. GSWC then totaled all customer complaints within the Ball Road Well service area as described in Q2.a.
e. Yes
f.

| Year | 2017 | 2018 | 2019 |
|---|---|---|---|
| Number of Complaints | 20 | 13 | 31 |

**Question 3:**
Please provide the individual complaints that GSWC counts toward the 2017, 2018, and 2019 annual totals in its Response to Public Advocates Data Request AA9-002, Q.3.a Attachment LA02. For each complaint, please include the description of the complaint, the resolution, the apparent cause, and the area within the system where the complaint was made.

**Response 3:**
Please see the attached file "Q3 West Orange System WQ Customer Complaint (2017 - 2019).xlsx".

**Question 4:**
In Attachment C-36 West Orange System Master Plan, page 2-3, GSWC lists Valley View Well No. 2 ("#2") as non-operational. Attachment C-36's Figure 2-1 shows Valley View Well No. 1 ("#1") as an "operating well."

a. When did GSWC remove Valley View Well #2 from service?
b. Before GSWC removed Valley View Well #2 from service, did Valley View Well #2 serve the area defined in Q.2.a?
c. Does GSWC plan to rehabilitate Valley View Well #2?
d. Is Valley View Well #1 operational?
e. If no to Q.4.d, when did GSWC remove Valley View Well #1 from service?
f. Did GSWC remove all assets from the Valley View Plant(s) from the 2022 and 2023 test years' forecasted utility plant-in-service?

**Response 4:**

a. November 2015
b. Yes, the area served by Valley View Well #2 generally aligns with the area defined in Q2.a.
c. GSWC has yet to make a decision to rehabilitate Valley View Well #2.
d. Valley View Well #1 has been abandoned and destroyed, and is listed in error as an active well in Figure 2-1, Attachment C-36.
e. The California Division of Drinking Water issued a letter of destruction for Valley View Well #1 on August 6, 2019.
f. Valley View Well #1, along with its corresponding assets, were retired in 2019 and therefore not included in GSWC's 2022 and 2023 forecasted utility plant-in-service.

**Question 5:**
The following questions refer to GSWC's existing assets at Ball Plant.

a. Besides Ball Road Well, does GSWC have any other utility plant-in-service at Ball Plant?
b. What year was Ball Road Well originally put into service?
c. What is the depreciation rate of Ball Road Well?
d. What is the original cost of Ball Road Well in utility plant-in-service?
e. What is the accumulated depreciation of Ball Road Well?
f. What is the original cost of Ball Plant's land in utility plant-in-service?
g. Please complete the table below by providing the annual water production in acre-feet ("AF").

| Year | 2015 | 2016 | 2017 | 2018 | 2019 | Average |
|---|---|---|---|---|---|---|
| Annual Water Production (AF) | | | | | | |

**Response 5:**

a. Yes it does.
b. 1961.
c. The current adopted composite depreciation rate is 2% per year.
d. $49,500.
e. GSWC does not record depreciation at the individual asset level. Depreciation is recorded by utility plant asset category utilizing a composite depreciation rate adopted by the CPUC in GSWC's General Rate Case. As such, the accumulated depreciation for Ball Road Well is not tracked within GSWC's accounting system.
f. $9,456.30
g.

| Year | 2015 | 2016 | 2017 | 2018 | 2019 | Average |
|---|---|---|---|---|---|---|
| Annual Water Production (AF) | 1,106 | 1,267 | 641 | 1,085 | 1,169 | 1,053 |

**Question 6:**

The following questions refer to purchased water connections in GSWC's West Orange System.

a. Is GSWC able to replace the water supplied by Ball Road Well with purchased water through the Municipal Water District of Orange County's connection OC-55?
b. Is GSWC able to replace the water supplied by Ball Road Well with purchased water from any connection in the West Orange System?
c. If no to Q.6.a and b, please explain why.

**Response 6:**

a. Yes
b. Yes
c. N/A

**Question 7:**

In "Hanford and Insco Operating District Capital Testimony," page 208, GSWC compared the unit costs of pumping groundwater and purchasing water in the Placentia system. In Attachment P05, GSWC provided a cost-benefit analysis of replacing Bradford Well No. 3 versus purchasing water.

a. What would be the unit cost in 2023 of groundwater produced at the West Orange system's Ball Road Well? Include the pump tax and energy and operating expenses as GSWC did in "Hanford and Insco Operating District Capital Testimony," page 208.
b. What would be the unit cost in 2023 of treating water from Ball Road Well if GSWC completes its planned iron and manganese removal system?
c. What is the unit cost in 2023 of purchasing water in the West Orange system?

d. What is the depreciation rate of GSWC's planned iron and manganese removal system?
e. Please provide a cost-benefit analysis of continuing to operate Ball Road Well versus purchasing water. Include the capital cost of Ball Road Well's land and equipment currently in rate base, the additional capital costs of acquiring land and installing equipment for the iron and manganese removal system, and the operating costs of pumping and treating water from the well.

**Response 7:**

a. Please see the attached file "Q7.a Ball Rd Well - 2023 Estimated OM Cost.pdf".
b. Please see the attached file "Q7.b Ball Rd Well - 2019 Estimated Fe and Mn Treatment OM Cost.pdf". Based on historic costs at the Bloomfield and Cherry wells in the West Orange County system we estimate this 2023 cost to be $11 per acre-foot.
c. Please see the attached file "Q7.c West Orange - 2023 Estimated Purchased Water Unit Cost.pdf".
d. In GSWC's GRC RO model, forecasted depreciation is calculated based upon a depreciation composite rate by total ratemaking area. The composite rate utilized to forecast depreciation on depreciable plant for Region 3 for the rate cycle 2022-2024 is 1.78%.
e. Please see the attached file "Q7.e Ball Road Well 1 Cost Benefit Analysis.pdf". Please note we included the original capital cost of all assets related to Ball Rd Well No. 1 in the cost for the Mn & Fe treatment, excluding accumulated depreciation. Therefore, the capital cost is overstated.

If you have any questions, please do not hesitate to call me at (909) 394-3600, Extension 680.

Sincerely yours,

Jon Pierotti

Digitally signed by Jon Pierotti
DN: cn=Jon Pierotti, o=GSWC, ou=Regulatory Affairs, email=jon.pierotti@gswater.com, c=US
Date: 2020.11.06 14:46:24 -08'00'

For Keith Switzer
Vice President – Regulatory Affairs

c: Eileen Odell, Project Lead
Victor Chan, Project Coordinator
Shanna Foley, Attorney for Public Advocates Office
Joseph Karp, Attorney for GSWC
Chris Kolosov, Attorney for GSWC
Jenny Darney-Lane, Manager of Regulatory Affairs
Jon Pierotti, Manager of Regulatory Affairs

**ATTACHMENT 2-2: GSWC RESPONSE TO PUBLIC ADVOCATES DATA REQUEST AA9-002, ATTACHMENT AA9-002 Q.3A**

**2015 Complaint Summary**

12. COMPLAINTS REPORTED (WRITTEN OR VERBAL)

| Type of Complaint | No. of Complaints Reported by Customers | No. of Complaints Investigated | No. of Complaints reported to the Division of Drinking Water or Local County Staff | Brief Description of Cause and Corrective Action taken |
|---|---|---|---|---|
| Taste and Odor | 0 | 0 | 0 | |
| Color | 56 | 56 | 56 | Flushed customer line or main, if applicable. Designed unidirectional flushing plan. |
| Turbidity | | | | |
| Visible Organisms | | | | |
| Pressure (High or Low) | 4 | 4 | 4 | Investigated, specific to service line or meter. |
| Water Outages[1] | | | | |
| Illnesses (Waterborne) | | | | |
| Other (Specify) | 1 | 1 | 1 | Flushed customer line until clear. |
| Total No. of Complaints* | 61 | 61 | 61 | |



[1]These are customer complaints of a water outage and not necessarily the same as the water outages reported under "System Problems" in the Distribution Section of the EARDWP.
*Calculated field

To update totals click here

**2016 Complaint Summary**

## 12. COMPLAINTS REPORTED (WRITTEN OR VERBAL)

| Type of Complaint | No. of Complaints Reported by Customers | No. of Complaints Investigated | No. of Complaints reported to the Division of Drinking Water or Local County Staff | Brief Description of Cause and Corrective Action taken |
|---|---|---|---|---|
| Taste and Odor | 0 | | | |
| Color | 74 | 74 | 74 | Color water was caused by Bloomfield treatment plant backwash tank equipment failure. Corrective action included flushing customer line or main and conducting unidirectional flushing in the area. |
| Turbidity | 0 | | | |
| Visible Organisms | 0 | | | |
| Pressure (High or Low) | 2 | 2 | 2 | Investigated, specific to line or meter |
| Water Outages[1] | 0 | | | |
| Illnesses (Waterborne) | | | | |
| Other (Specify) | 3 | | | Particulates, sand in water. Flushed customer line until clear. |
| Total No. of Complaints* | 79 | 76 | 76 | |

http://drinc.ca.gov/EAR/PWSEarReport.aspx?printable=yes&SurveyID=17&PwsID

[1]These are customer complaints of a water outage and not necessarily the same as the water outages reported under "System Pr Section of the EARDWP.

*Calculated field

To update totals click here

## 2017 Complaint Summary

12. COMPLAINTS REPORTED (WRITTEN OR VERBAL)

| Type of Complaint | No. of Complaints Reported by Customers | No. of Complaints Investigated | No. of Complaints reported to the Division of Drinking Water or Local County Staff | Brief Description of Cause and Corrective Action taken |
|---|---|---|---|---|
| Taste and Odor | 0 | 0 | 0 | |
| Color | 48 | 48 | 48 | Flushed customer line or main, if applicable. Conducted unidirectional flushing in area. |
| Turbidity | 0 | 0 | 0 | |
| Visible Organisms | 0 | 0 | 0 | |
| Pressure (High or Low) | 2 | 2 | 0 | |
| Water Outages[1] | 0 | 0 | 0 | |
| Illnesses (Waterborne) | 0 | 0 | 0 | |
| Other (Specify) | 1 | 1 | 1 | Sand |
| Total No. of Complaints* | 51 | 51 | 49 | |



[1]These are customer complaints of a water outage and not necessarily the same as the water outages reported under "System Problems" in the Distribution Section of the EARDWP.
*Calculated field

To update totals click here

COMMENTS:

## 2018 Complaint Summary

### 11. COMPLAINTS REPORTED (WRITTEN OR VERBAL)

| Type of Complaint | No. of Complaints Reported by Customers | No. of Complaints Investigated | No. of Complaints reported to the Division of Drinking Water or Local County Staff | Brief Description of Cause and Corrective Action taken |
|---|---|---|---|---|
| Taste and Odor | | | | |
| Color | 23 | | | |
| Turbidity | | | | |
| Visible Organisms | | | | |
| Pressure (High or Low) | | | | |
| Water Outages[1] | | | | |
| Illnesses (Waterborne) | | | | |
| Other (Specify) | 1 | | | debris in water |
| Total No. of Complaints* | 24 | 0 | 0 | |

[1]These are customer complaints of a water outage and not necessarily the same as the water outages reported under "System Problems" in the Distribution Section of the EARDWP.
*Calculated field

To update totals click here

COMMENTS (Note: Comments will be made publicly available):

## 2019 Complaint Summary

### 11. COMPLAINTS REPORTED (WRITTEN OR VERBAL)

| Type of Complaint | No. of Complaints Reported by Customers | No. of Complaints Investigated | No. of Complaints reported to the Division of Drinking Water or Local County Staff | Brief Description of Cause and Corrective Action taken |
|---|---|---|---|---|
| Taste and Odor | | | | |
| Color | 43 | 43 | | Construction related color complaints, unidire |
| Turbidity | | | | |
| Visible Organisms | | | | |
| Pressure (High or Low) | | | | |
| Water Outages[1] | | | | |
| Illnesses (Waterborne) | | | | |
| Other (Specify) | | | | |
| Total No. of Complaints* | 43 | 43 | 0 | |

[1]These are customer complaints of a water outage and not necessarily the same as the water outages reported under "System Problems" in the Distribution Section of the EARDWP.
*Calculated field

To update totals click here

COMMENTS (Note: Comments will be made publicly available):

**<u>ATTACHMENT 2-3: GSWC RESPONSE TO PUBLIC ADVOCATES DATA REQUEST AA9-002, ATTACHMENT AA9-002 Q.2D</u>**

**UDF Cost Estimate for Area Surrounding Ball Road Plant**

| | Total Volume Flushed (gals) | Total Volume Flushes (A.F) | Water Cost (USD) | UDF Flushing Labor Hours | UDF Labor Cost (USD) |
|---|---|---|---|---|---|
| Area 1 | 717,700 | 3 | $ 4,125 | 90 | $ 3,960 |
| Area 2 | 451,410 | 2 | $ 2,750 | 108 | $ 4,752 |
| Area 3 | 479,480 | 2 | $ 2,750 | 72 | $ 3,168 |
| Area 4 | 1,752,300 | 6 | $ 8,250 | 288 | $ 12,672 |
| Total per UDF Event | 3,400,890 | 13.0 | $ 17,875 | 558 | $ 24,552 |

| | | | |
|---|---|---|---|
| Annual UDF Water Cost | $ 18,000 | | |
| Annual UDF Labor Cost | $ 25,000 | | |
| Annual Water Quality Complaint Field Investigation Cost | $ 2,409 | | |
| Total Annual Labor Cost | $ 27,409 | Add fuel and vehicle charges/night | 52 |
| 1 Year Total Cost | $ 49,059 | Total Fuel and Vehicle Charges | $ 3,650 |
| 5 Year Total Cost | $ 273,738 | | |
| 7.5 Year Total Cost | $ 451,236 | | |
| 10 Year Total Cost | $ 661,555 | | |
| 15 Year Total Cost | $ 1,201,846 | | |
| 20 Year Total Cost | $ 1,945,261 | | |

Notes

| | | |
|---|---|---|
| Labor cost for per hour= | $ 44 | (2020 Average WDO fully loaded internal labor rate) |
| Water cost per cfs= | $ 1,375 | (2020-2021 Cost per AF MWD with capacity charges and RTS) |

Labor hour and volume flushed estimated based on 2015 UDF effort

Assumes annual UDF efforts around the Ball Plant only (UDF Areas 1-4); 14 weeks total with two trucks per night averaging 15 miles each per night and 3 gallons each of fuel consumption

Assume water used to flush Area 1-4 is MWD full treated import water from OC-55 (closest source to Ball Road Plant)

| | |
|---|---|
| Labor Escalation | 3.0% |
| Annual Water Cost Escalation | 5.0% |

Hours operators spent on investigating complaints is calculated by the 2013-2016 average annual discolored water complaints multipled by 1 hr of investigation per complaint.

| | | |
|---|---|---|
| 1 | 1 Year | $ 49,059 |
| 5 | 5 Year | 313064.2096 |
| 10 | 10 Year | |

| | Fe & Mn Removal System |
|---|---|
| Cost for Design and Permit | $ 183,900.00 |
| Cost for Construction | $ 1,062,700.00 |
| **Total Cost** | **$ 1,246,600.00** |

| | |
|---|---|
| 2021 Cost per AF MWD with capacity charges and RTS | $ 1,375.00 |
| Average WDO Labor Charge/hr | 29 |
| Average Loaded WDO Labor Charge/hr | 44 |

**As of 08/08/2020**

| CSA | Position | Average Salary | abor Burden @50% | Total Labor Cost |
|---|---|---|---|---|
| Los Alamitos | WDO 1 | 47,367 | 23,683 | 71,050 |
| | WDO 2 | 64,329 | 32,164 | 96,493 |
| **Los Alamitos Total** | | **59,240** | **29,620** | **88,860** |
| Placentia/Yorba Linda | WDO 1 | 47,545 | 23,773 | 71,318 |
| | WDO 2 | 63,886 | 31,943 | 95,829 |
| **Placentia/Yorba Linda Total** | | **61,843** | **30,922** | **92,765** |
| **Average Total** | | **60,397** | **30,198** | **90,595** |
| Water Supply | WSO 1 | 57,022 | 28,511 | 85,534 |
| | WSO 2 | 65,793 | 32,896 | 98,689 |
| | WSO 3 | 85,263 | 42,631 | 127,894 |
| **Water Supply Total** | | **70,821** | **35,411** | **106,232** |
| **Average Total with Water Supply** | | **63,003** | **31,502** | **94,505** |

**ATTACHMENT 2-4: GSWC RESPONSE TO PUBLIC ADVOCATES DATA REQUEST LCN-003**

Golden State
Water Company
A Subsidiary of American States Water Company

September 3, 2020

Lauren Cunningham, Public Advocates Office
**CALIFORNIA PUBLIC UTILITIES COMMISSION**
505 Van Ness Avenue
San Francisco, CA 94102

Subject: Data Request LCN-003 (A.20-07-012) NO-DES Filters Response
Due Date: September 3, 2020

Dear Lauren Cunningham,

In response to the above referenced data request number, we are pleased to submit the following responses:

The following questions refer to the Direct Testimony of Brad Powell, which states at page 10:

> "Costs of $21,000 per year have been added to inflation-adjusted, five-year historical average for Central (Region 2 RMA), Southwest (Region 2 RMA) and Orange County Districts (Region 3 RMA) related to additional Neutral Output Discharge Elimination System ("NO-DES") filters. These disposal bag filters will allow more instances of NO-DES main flushing which is superior to conventional flushing as it removes sediments and particulate matter during the flushing operation and conserves water."

**Question 1:**
Please provide an explanation and cost-benefit analysis for NO-DES flushing versus conventional flushing.

**Response 1:**
Typical distribution flushing operations remove unwanted particulates in a specific area by expelling the potable water holding those particulates. The NO-DES flushing equipment GSWC purchased in 2019 preserves system water via filtration vessels and reintroduces the filtered water to the distribution system through carefully controlled and monitored procedures. This water-conserving approach reduces water loss compared to

conventional flushing methods. As the NO-DES process is new technology and only began being used in GSWC's system in late 2019, there are no recorded O&M costs in the five-year history for replacement filter costs. NO-DES was implemented as an environmentally-responsible way to improve water quality. In addition to the critical water conservation benefits, significantly reducing the amount of potable water lost during flushing procedures will enable GSWC to comply with water loss control regulations currently under development. A formal cost-benefit analysis has not been conducted and would depend on various factors including the amount of NO-DES flushing performed in a given period.

**Question 2:**
Please provide an explanation and documentation supporting how much water NO-DES filters would save per year. Also provide explanation on why a cost of $21,000 should be added where the NO-DES flushing will reduce water waste during flushing.

**Response 2:**
Based on equipment flow meter data from August 2019 through August 2020, the initial, introductory flushing operations GSWC conducted with the NO-DES system conserved 3.33 million gallons (MG) of potable water. In addition to the significant water savings generated through this method, the related savings of supply and treatment costs provide valuable ancillary benefits. The disposable bag filters utilized in the NO-DES process allow the flushed water to be reintroduced to the system. The proposed $21,000 would provide the materials needed to flush (and conserve) approximately 36 MG of potable water. The filter costs are being added to certain CSAs because this new flushing process has not been used in the past anywhere in GSWC's service areas and there are no previous filter expenses in the historical cost data. Due to the nominal filter costs (based on the volume of water a filter can process) there would essentially be no financial or water loss costs associated with the NO-DES flushing process. Conversely, conventional flushing wastes significant potable water and all the associated costs to obtain and treat the water.

If you have any questions, please do not hesitate to call me at (909) 394-3600, Extension 680.

Sincerely yours,

jadarney Digitally signed by jadarney
DN: cn=jadarney
Date: 2020.09.03 09:21:13
-07'00'

*For* Keith Switzer
Vice President – Regulatory Affairs

c: Eileen Odell, Project Lead
Victor Chan, Project Coordinator
Shanna Foley, Attorney for Public Advocates Office
Joseph Karp, Attorney for GSWC
Chris Kolosov, Attorney for GSWC
Jenny Darney-Lane, Manager of Regulatory Affairs
Jon Pierotti, Manager of Regulatory Affairs

# ATTACHMENT 2-5: WATER SAVINGS DUE TO IMPLEMENTATION OF NO-DES FLUSHING

This attachment explains Cal Advocates' recommended adjustments to GSWC's projected water supply and non-revenue water to account for GSWC's implementation of NO-DES flushing.

The Commission should reduce GSWC's projected water supply and non-revenue water by a total of 59,400 CCF per year. By district, this adjustment reduces the Central, Southwest, and Orange County water supply forecasts by 6,000 CCF, 48,000 CCF, and 5,400 CCF per year, respectively. Cal Advocates estimates that these adjustments will decrease water supply expenses and non-revenue water by $135,000 per year.

Using NO-DES flushing will conserve water compared to conventional flushing. GSWC states that NO-DES flushing is "superior to conventional flushing as it removes sediments and particulate matter during the flushing operation and conserves water."[165] During conventional flushing, a water utility discharges the water used to flush the distribution system as waste. In contrast, a water utility that uses NO-DES flushing will flush in a loop within the distribution system. Instead of pumping the water to waste, NO-DES flushing will pump the water through NO-DES filters, removing sediments and particulate matter before returning the water to the distribution system.[166] According to NO-DES, Inc., the only water that a utility wastes during NO-DES flushing is the amount spilled from hoses.[167] GSWC states that there would essentially be no water loss costs associated with NO-DES flushing.[168]

GSWC will have the NO-DES equipment and materials to flush up to 48,000 hundred cubic feet ("CCF") of water per year in three districts. GSWC plans to purchase NO-DES vehicles for $1,673,818 in 2019 and $437,387 in 2020. Additionally, GSWC plans to add $21,000 per year for NO-DES filters to three of its districts' expenses to begin NO-DES flushing. The three districts are the Central and Southwest districts in the Region II ratemaking area ("RMA") and the Orange County district in the Region III

[165] GSWC Prepared Testimony of Brad Powell, p. 10, lines 15-16.
[166] GSWC. Video. NO-DES: A Fresh Approach to an Old Practice - YouTube.
[167] NO-DES Inc., Flushing Technology, "Water Loss – Water Saved." Web. https://www.no-des.com/flushing-technology.
[168] Attachment 2-4, GSWC Response to Public Advocates Data Request LCN-003, Q.2.

RMA.[169] In response to discovery, GSWC states that it plans to purchase enough filters to flush up to 48,000 CCF of water per year in each of the three districts.[170]

GSWC forecasts its water supply expense for the test years based, in part, on historical non-revenue water lost in conventional flushing. To forecast its water supply expense, GSWC first finds the average percentage of historical water supply that became non-revenue water for the 2015 to 2019 years. Then, GSWC estimates its water supply forecast by increasing its water sales forecast by the 2015-2019 average non-revenue water percentage.[171]

Water lost in conventional flushing contributes to the 2015-2019 non-revenue water that GSWC uses to forecast test year non-revenue water. Between 2015 and 2019, GSWC flushed average volumes of 6,000 CCF, 128,000 CCF, and 5,400 CCF per year in its Central, Southwest, and Orange County districts, respectively.[172] GSWC states that it began introductory NO-DES flushing operations in August 2019.[173] Since GSWC only began introductory NO-DES flushing in late 2019, GSWC's 2015-2019 flushing volumes represent the water lost in conventional flushing. Therefore, the historical non-revenue water percentage that GSWC uses to forecast test year volumes assumes that GSWC will continue to use conventional flushing at the same 2015-2019 rates. This assumption is inaccurate because GSWC's implementation of NO-DES flushing in these districts will conserve the water that has historically been lost in flushing.

The Commission should decrease the non-revenue water, and consequently, the total water supply forecast to account for water conserved by implementing NO-DES flushing. During the test years, GSWC will have the NO-DES equipment and enough filters to flush up to 48,000 CCF of water in each of the three districts. The Commission

[169] GSWC Prepared Testimony of Brad Powell, p. 10, lines 11-14.

[170] Attachment 2-4, GSWC Response to Public Advocates Data Request LCN-003, Q.2. Note: 36 million gallons of water is equal to 48,000 CCF rounded to two significant digits ($36{,}000{,}000 \text{ gallons} \times \frac{1 \text{ cubic foot}}{7.4805 \text{ gallons}} \times \frac{1 \text{ CCF}}{100 \text{ cubic feet}} = 48{,}125 \text{ CCF}$).

[171] GSWC Prepared Testimony of Nanci Tran, p. 8, line 24 to p. 9, line 16.

[172] Attachment 2-7, GSWC Response to Public Advocates Data Request AA9-015, Q.1e.

[173] Attachment 2-4, GSWC Response to Public Advocates Data Request LCN-003, Q.2.

should reduce the non-revenue water forecast of GSWC's Central and Orange County districts by the average flushed volumes of 6,000 CCF and 5,400 CCF, respectively. GSWC will have more than enough NO-DES filters to completely replace conventional flushing with NO-DES flushing in the Central and Orange County districts. For the Southwest district, however, the Commission should reduce the non-revenue water forecast by 48,000 CCF. Although GSWC's Southwest district has historically flushed more than 48,000 CCF per year, GSWC will only have enough filters to use NO-DES flushing for up to 48,000 CCF.

The Commission should proportionally reduce GSWC's forecasted water supply for each of the CSA's source and purveyors. Water supply costs vary by system, source (i.e., pumped groundwater or purchased water), and purveyor. Cal Advocates asked GSWC to identify each water system where GSWC would implement NO-DES flushing and each water source and purveyor whose production would be reduced by NO-DES flushing. In response, GSWC named every CSA, source, and water purveyor in the Central, Southwest, and Orange County districts. GSWC states that it will use NO-DES flushing at some level in all CSAs and will reduce the production of all sources and purveyors.[174] The Commission should therefore reduce the water supply for each source and purveyor proportionally to the source or purveyor's total forecasted production. This adjustment is reasonable since GSWC is likely to conserve more water from sources or purveyors it uses more.

Cal Advocates' recommended adjustments to GSWC's water supply forecast proportionally reduce production from each source and purveyor in the three districts. Cal Advocates first found the average volume that GSWC historically flushed in each of the three districts' CSAs. For example, of the total 6,000 CCF that GSWC flushed in an average year in the Central district, about 2,700 CCF was in the district's Central Basin-East CSA. Cal Advocates then found the percentage of each source and purveyor in GSWC's water supply forecast for the CSA. For example, the pumped water source

[174] Attachment 2-7, GSWC Response to Public Advocates Data Request AA9-015, Q.1a and e.

makes up 81% of GSWC's supply forecast for the Central Basin-East CSA. Finally, Cal Advocates estimated the source production that would be reduced by multiplying the source's percentage of the forecast by the CSA's historical flushed volume. For example, 81% of 2,700 CCF is about 2,180 CCF. Accordingly, the Commission should reduce GSWC's supply forecast for pumped water in the Central Basin-East CSA by 2,180 CCF.

The Commission should reduce GSWC's forecasted water supply due to NO-DES flushing by a total of 59,400 CCF per year. Cal Advocates estimates that these adjustments will decrease water supply expenses and non-revenue water by $135,000 per year. Cal Advocates estimated this amount by multiplying the source or purveyor production that would be reduced by the appropriate quantity charge for that source or purveyor. For example, the quantity charge for pumped water in the Central Basin-East CSA is $382 per acre-foot ("AF"). Since Cal Advocates' recommended adjustment to the Central Basin-East CSA's pumped water is 2,180 CCF, equivalent to about 5 AF, the savings from this source is about $1,910 per year. Cal Advocates calculates a total savings of $135,000 from all source and purveyor reductions in the three districts according to the worksheet on the next page.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Water Supply and Non-Revenue Water Adjustment due to savings from NO-DES flushing | | | | | | |
| | | | | | | | | |
| Historical Flushing (in CCF) | District | CSA | 2015 | 2016 | 2017 | 2018 | 2019 | Average |
| | Central | Central Basin-East | 2,347 | 3,078 | 2,837 | 2,706 | 2,544 | **2,702** |
| | | Central Basin-East | 5,895 | 2,594 | 2,668 | 2,906 | 2,661 | **3,345** |
| | | Culver City | 17 | 66 | 61 | 0 | 0 | **28.8** |
| | | | | | | | | |
| | Southwest | Southwest | 43,643 | 129,117 | 77,171 | 213,390 | 174,339 | **127,532** |
| | | | | | | | | |
| | Orange County | Los Alamitos | 5,204 | 6,653 | 9,868 | 388 | 4,565 | **5,336** |
| | | Placentia | 45 | 0 | 216 | 0 | 140 | **80** |
| | | | | | | | | |
| Revenue System | CSA | Source/Purveyor | GSWC Forecast (in CCF) | Percentage of Forecast | Cal Advocates Adjustments (in CCF) | Quantity Charge per AF | Cal Advocates Adjustments (in AF) | Estimated Savings |
| 2001 | Central Basin East | Pumped Water | 3,382,649 | 0.81 | (2,179) | $ 382 | 5.00 | $ 1,911 |
| | | R2-Central Basin MWD | 648,956 | 0.15 | (418) | $ 1,268 | 0.96 | $ 1,217 |
| | | R2-City of Cerritos | 49,575 | 0.01 | (32) | $ 1,284 | 0.07 | $ 94 |
| | | R2-City of Lakewood | 430 | 0.00 | 0 | $ 1,268 | 0.00 | $ - |
| | | R2-Suburban Water | 0 | 0.00 | 0 | | 0.00 | $ - |
| | | R2-Central Basin MWD - Reclaimed | 110,485 | 0.03 | (71) | $ 759 | 0.16 | $ 124 |
| | | City of Cerritos-Recycled | 2,375 | 0.00 | (2) | $ 958 | 0.00 | $ 4 |
| | | | | | | | | |
| 2002 | Central Basin West | Pumped Water | 4,901,302 | 0.96 | (3,208) | $ 382 | 7.36 | $ 2,813 |
| | | R2-Central Basin MWD | 140,302 | 0.03 | (92) | $ 1,268 | 0.21 | $ 268 |
| | | R2-City of Paramount | 0 | 0.00 | 0 | | 0.00 | $ - |
| | | R2-City of South Gate | 10,264 | 0.00 | (7) | $ 1,268 | 0.02 | $ 20 |
| | | R2-Central Basin MWD - Reclaimed | 57,786 | 0.01 | (38) | $ 759 | 0.09 | $ 66 |
| | | | | | | | | |
| 2003 | Culver City | R2-West Basin MWD | 2,151,281 | | (29) | $ 1,441 | 0.07 | $ 96 |
| | | | | | | | | |
| 2004 | Southwest | Pumped Water | 3,822,935 | 0.30 | (14,434) | $ 382 | 33.14 | $ 12,658 |
| | | R2-West Basin MWD | 7,912,662 | 0.62 | (29,876) | $ 1,441 | 68.59 | $ 98,832 |
| | | R2-Central Basin MWD | 798,611 | 0.06 | (3,015) | $ 1,268 | 6.92 | $ 8,776 |
| | | R2-West Basin MWD - Reclaimed | 178,690 | 0.01 | (675) | $ 1,235 | 1.55 | $ 1,914 |
| | | | | | | | | |
| 3001 | Los Alamitos | Pumped Water | 5,828,185 | 0.91 | (4,853) | $ 487 | 11.14 | $ 5,426 |
| | | OC-Orange County MWD | 465,897 | 0.07 | (388) | $ 1,104 | 0.89 | $ 983 |
| | | OC-City of Seal Beach | 14,463 | 0.00 | (12) | $ 980 | 0.03 | $ 27 |
| | | City of Cerritos-Recycled | 99,469 | 0.02 | (83) | $ 671 | 0.19 | $ 128 |
| | | | | | | | | |
| 3002 | Placentia | Pumped Water | 2,419,849 | 0.60 | (48) | $ 487 | 0.11 | $ 54 |
| | | OC-Orange County MWD | 1,126,607 | 0.28 | (22) | $ 1,104 | 0.05 | $ 56 |
| | | OC-East Orange County WD | 495,116 | 0.12 | (10) | $ 1,104 | 0.02 | $ 25 |
| | | | | | | | | |
| | | | Adjustment Total | | (59,492) | Estimated Savings Total | | **$135,493** |

**ATTACHMENT 2-6: CAL ADVOCATES FE AND MN REMOVAL SYSTEM REVENUE REQUIREMENT ANALYSIS**

Scenario 1 - Ball Road Fe & Mn Treatment

| FY | Gross Plant (a) | Book Deprec. Expense (b) | Accum. Deprec. (c) | Net Plant (d) (a)-(c) | … | Revenue Requirement (u) |
|---|---|---|---|---|---|---|
| 1 | 4,844,800 | 31,029 | 31,029 | 4,813,771 | | $302,437 |
| 2 | 4,844,800 | 62,058 | 93,087 | 4,751,713 | | $572,537 |
| 3 | 4,844,800 | 62,058 | 155,144 | 4,689,656 | | $565,914 |
| 4 | 4,844,800 | 62,058 | 217,202 | 4,627,598 | | $559,325 |
| 5 | 4,844,800 | 62,058 | 279,260 | 4,565,540 | | $552,771 |
| 6 | 4,844,800 | 62,058 | 341,318 | 4,503,482 | | $546,254 |
| 7 | 4,844,800 | 62,058 | 403,376 | 4,441,424 | | $539,777 |
| 8 | 4,844,800 | 62,058 | 465,433 | 4,379,367 | | $533,340 |
| 9 | 4,844,800 | 62,058 | 527,491 | 4,317,309 | | $526,947 |
| 10 | 4,844,800 | 62,058 | 589,549 | 4,255,251 | | $520,599 |
| 11 | 4,844,800 | 62,058 | 651,607 | 4,193,193 | | $514,298 |
| 12 | 4,844,800 | 62,058 | 713,664 | 4,131,136 | | $508,047 |
| 13 | 4,844,800 | 62,058 | 775,722 | 4,069,078 | | $501,849 |
| 14 | 4,844,800 | 62,058 | 837,780 | 4,007,020 | | $495,705 |
| 15 | 4,844,800 | 62,058 | 899,838 | 3,944,962 | | $489,619 |
| 16 | 4,844,800 | 62,058 | 961,896 | 3,882,904 | | $483,594 |
| 17 | 4,844,800 | 62,058 | 1,023,953 | 3,820,847 | | $477,632 |
| 18 | 4,844,800 | 62,058 | 1,086,011 | 3,758,789 | | $471,738 |
| 19 | 4,844,800 | 62,058 | 1,148,069 | 3,696,731 | | $465,913 |
| 20 | 4,844,800 | 62,058 | 1,210,127 | 3,634,673 | | $460,162 |
| | | | | **Total** | | **$10,088,458** |

**ATTACHMENT 2-7: GSWC RESPONSE TO PUBLIC ADVOCATES DATA REQUEST AA9-015**

Golden State
Water Company
A Subsidiary of American States Water Company

November 12, 2020

Anthony Andrade, Public Advocates Office
**CALIFORNIA PUBLIC UTILITIES COMMISSION**
505 Van Ness Avenue
San Francisco, CA 94102

Subject: Data Request AA9-015 (A.20-07-012)
NO-DES and System Flushing Response
Due Date: November 13, 2020

Dear Anthony Andrade,

In response to the above referenced data request number, we are pleased to submit the following responses:

**Question 1:**
In the "Prepared Testimony of Brad Powell," page 10, lines 11-14, GSWC states that it adds costs for Neutral Output Discharge Elimination System ("NO-DES") filters to its Central, Southwest and Orange County district expenses. On page 10, lines 14-16, GSWC states that NO-DES flushing conserves water.

a. Please name the water systems where GSWC plans to use the NO-DES filters.

b. In the RO model file "SEC-30_REV_Water Production," tab "Rec Wtr Prod WS-02," GSWC projects water production by source and purveyor. GSWC designates that tab's rows 39-54 and 81 for "Region 2 – Metro." Please complete the following table by identifying the Region 2 customer service areas ("CSAs") that correspond to the tab's rows.

| Customer Service Area | "Rec Wtr Prod WS-02" Rows |
|---|---|
| *Example: Central Basin West* | *Example: Rows 45-50* |
| ... | ... |

c. Please provide a copy of tab "Rec Wtr Prod WS-02," in pdf format with the "Region 2 – Metro" rows highlighted in different colors representing the different Region 2 CSAs.

d. In the RO model file "SEC-30_REV_Water Production," tab "Rec Wtr Prod WS-02," columns D and E, GSWC lists water sources and purveyors. Please complete the following table for each system that GSWC names in response to Q.1.a by providing the water sources and purveyors whose production will be reduced due to GSWC's planned NO-DES flushing.

| System | Water Sources and Purveyors |
|---|---|
| *Example: Southwest System* | *Examples: Pumped Water, R2-West Basin MWD* |
| ... | ... |

e. Please complete the table below for each water system that GSWC names in response to Q.1.a by providing the historical water amounts used for flushing in hundred cubic feet ("CCF").

| Year | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|
| Water Used for Flushing (CCF) | | | | | |

**Response 1:**

a. GSWC plans to selectively use the NO-DES flushing process throughout the Central, Southwest, and Orange County Districts. The NO-DES process will be used in certain flushing instances (as determined by future operational needs), but it will not be used in all flushing activities. Accordingly, the following Customer Service Areas will utilize the NO-DES process at some level within the identified Districts:

| District | Customer Service Areas |
|---|---|
| Region 2: Central | Central Basin-East, Central Basin-West, Culver City |
| Region 2: Southwest | Southwest |
| Region 3: Orange County | Los Alamitos, Placentia |

b. See table below:

| Customer Service Area | "Rec Wtr Prod WS-02" Rows |
|---|---|
| Central Basin-East | Rows 39-44, 81 |
| Central Basin-West | Rows 45-49 |
| Culver City | Row 50 |
| Southwest | Rows 51-54 |

c. See attached file "AA9-015 NO DES Q.1c Rec Wtr Prod WS-01 Highlighted" in PDF format. The Region 2 CSAs are designated with highlighting as follows:
- Yellow = Central Basin East
- Green = Central Basin West
- Blue = Culver City
- Grey = Southwest

For Region 2, since the "Revenue System Description" column (second column from the left) does not specify the CSA, referencing the "CSA" column (fifth column from the left) will allow for CSA identification via the CSA code on each row.

d. The following table includes the water sources and purveyors for each Customer Service Area identified in Response 1a. above:

| Customer Service Area | Water Sources and Purveyors |
|---|---|
| Central Basin-East | Pumped water, Central Basin MWD, City of Cerritos, City of Lakewood, Suburban Water, Central Basin MWD-Reclaimed Water, City of Cerritos-Recycled |
| Central Basin-West | Pumped water, Central Basin MWD, City of Paramount, City of South Gate, Central Basin MWD-Reclaimed Water |
| Culver City | West Basin MWD |
| Southwest | Pumped water, West Basin MWD, Central Basin MWD, West Basin MWD-Reclaimed Water |
| Los Alamitos | Pumped water, Orange County MWD, City of Seal Beach, City of Cerritos-Recycled |
| Placentia | Pumped water, Orange County MWD, East Orange County WD |

e. The following table includes the historical annual volume of water used for flushing activities in hundred cubic feet ("CCF") for each Customer Service Area identified in Response 1a. above:

| Customer Service Area | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|
| Central Basin-East | 2,347 | 3,078 | 2,837 | 2,706 | 2,544 |
| Central Basin-West | 5,895 | 2,594 | 2,668 | 2,906 | 2,661 |
| Culver City | 17 | 66 | 61 | 0 | 0 |
| Southwest | 43,643 | 129,117 | 77,171 | 213,390 | 174,339 |
| Los Alamitos | 5,204 | 6,653 | 9,868 | 388 | 4,565 |
| Placentia | 45 | 0 | 216 | 0 | 140 |

As indicated in Response 1a., adding NO-DES as an option for operational flushing requirements will not eliminate conventional flushing activities completely. The amount of potable water that will be conserved in future years is unknown as it will depend on frequency of NO-DES usage, project size (i.e. volume of water flushed), etc. within each CSA.

If you have any questions, please do not hesitate to call me at (909) 394-3600, Extension 680.

Sincerely yours,

Jon Pierotti Digitally signed by Jon Pierotti DN: cn=Jon Pierotti, o=GSWC, ou=Regulatory Affairs, email=jon.pierotti@gswater.com, c=US Date: 2020.11.12 10:49:01 -08'00'

For Keith Switzer
Vice President – Regulatory Affairs

c: Eileen Odell, Project Lead
Victor Chan, Project Coordinator
Shanna Foley, Attorney for Public Advocates Office
Joseph Karp, Attorney for GSWC
Chris Kolosov, Attorney for GSWC
Jenny Darney-Lane, Manager of Regulatory Affairs
Jon Pierotti, Manager of Regulatory Affairs

**ATTACHMENT 3-1: GSWC RESPONSE TO PUBLIC ADVOCATES DATA REQUEST AA9-005**

Golden State
Water Company
A Subsidiary of American States Water Company

September 11, 2020

Anthony Andrade, Public Advocates Office
**CALIFORNIA PUBLIC UTILITIES COMMISSION**
505 Van Ness Avenue
San Francisco, CA 94102

Subject: Data Request AA9-005 (A.20-07-012) Region OC Reservoirs Response
Due Date: September 4, 2020; Extension Due Date: September 11, 2020

Dear Anthony Andrade,

In response to the above referenced data request number, we are pleased to submit the following responses:

**Question 1:**
In "Hanford and Insco Operating District Capital Testimony," page 202, line 25, GSWC requests to replace the North and South reservoirs at Clearview Plant with two 0.10 million gallon (MG) tanks. On page 203, lines 2-3 and 7-9, GSWC states that the existing reservoirs have a combined capacity of 0.209 MG and "pose operational limitations due to their size and result in operational storage deficiency."

a. Do GSWC's requested replacements, the two 0.10-MG tanks, have a combined capacity less than the 0.209 MG of the existing reservoirs?
b. Would GSWC's requested 0.10 MG replacements also pose operational limitations due to their size?
c. Please provide an explanation and a schematic diagram showing how the current reservoirs result in the operatonal storage deficiency and how the proposed reservoirs would mitigate the operational storage deficiency.

**Response 1:**

a. Yes.
b. No.
c. This project is to improve the storage operational efficiency in the Cowan Heights system. Currently, the existing reservoirs have different tank floor elevations and different tank heights, which creates operational challenges. The proposed

reservoirs will have the same tank floor elevation and overall height dimension, which will allow GSWC to utilize the full capacity of both reservoirs concurrently thus improving the operational efficiency. Please see attached "Q1.c Clearview Reservoir Side Profile.pdf".

**Question 2:**
GSWC provided Potable Divers Inc. (PDI)'s 2014 underwater cleaning and inspection report of the "Round Tank" as Attachment P01. GSWC also provided PDI's 2017 reports for both the "Round Tank" and "Square Tank" as Attachment P02.

a. In Attachments P01 and P02, PDI refers to the Clearview reservoirs as the "Round Tank" and the "Square Tank." Please explain if the "Round Tank" refers to the North Reservoir and the "Square Tank" refers to the South Reservoir.
b. What are PDI's relevant qualifications for inspecting and making conclusions about the condition of reservoirs?
c. Attachment P01, pages 9-10, contain ANSI/AWWA D 101-53 (R86) data sheets. Did PDI also prepare these data sheets for its 2017 "Square Tank" and "Round Tank" inspections? If yes, please provide the data sheets.
d. Did PDI inspect the "Square Tank" in 2014? If so, please provide the PDI report for the 2014 "Square Tank" inspection and include all data sheets.
e. In Attachment P02, page 16, PDI lists its recommendations for the "Round Tank," including replacing the roof vent and overflow pipe and conducting a structural evaluation of the roof. Has GSWC performed these actions? If not, explain why.

**Response 2:**

a. The "Round Tank" refers to the North Tank and the "Square Tank" refers to the South Tank.
b. Please see attachment "Q2.b PDI Qualification David Harvey.pdf"
c. No.
d. Please see attachment "Q2.d PDI Clearview Square Tank Inspection March 2014.pdf"
e. No, GSWC could not take the North Reservoir out of service for structural evaluation due to the failure of the hypalon liner in the South Reservoir causing further restriction in operational storage.

**Question 3:**
In "Hanford and Insco Operating District Capital Testimony," page 203, lines 6-7, GSWC states that Potable Divers Inc. (PDI) discovered a hole in the South Reservoir's Hypalon liner. In Attachment P02, page 8, PDI states the liner was repaired.

a. Did PDI repair the hole as part of its 2017 inspection?

b. Have cracks formed in the South Reservoir's roof, shell or floor. If yes, provide the field or inspection report noting the cracks.
c. In "Hanford and Insco Operating District Capital Testimony," page 203, line 9, GSWC states that both Clearview reservoirs have exceeded their useful life. Please explain how GSWC concluded that the South Reservoir exceeded its useful life.
d. Please provide the date when the South Reservoir (Square Tank) was constructed. If the South Reservoir has been reconstructed, please provide the date of the latest reconstruction.
e. Please provide the date when the South Reservoir's Hypalon liner was installed.

**Response 3:**

a. Yes.
b. Yes, see attached "Q3.b Clearview Photos – South Reservoir 11-20-19.pdf"
c. GSWC concluded this based on age, condition, inspection reports, and failures.
d. Construction date is unknown.
e. The hypalon liner was installed in 1995.

**Question 4:**
Please provide separate cost estimates for rehabilitating the Clearview North Reservoir and the South Reservoir.

**Response 4:**
No such estimates have been prepared.

**Question 5:**
Please provide the cost estimate of replacing only one Clearview Reservoir.

**Response 5:**
No such estimate was prepared. The site is physically not large enough to accommodate a single tank that is large enough to meet the storage volume requirement, therefore; two tanks are required to achieve the designated storage volume. Since two tanks are necessary to achieve the designated storage volume, we did not consider nor did we evaluate the cost for constructing one single tank that will not meet the system needs.

**Question 6:**
In Attachment C-27 Cowan Heights System Master Plan, pages 5-6 through 5-24, GSWC provides its Supply and Capacity Analysis for each of the system's pressure zones.
In Attachment C-27, page 5-2, GSWC states that since the CPUC and Division of Drinking Water currently provide no specific requirements for storage volume, GSWC

considered American Water Works Associated (AWWA) standards to develop its storage criteria. On pages 5-24 through 5-28, GSWC provides a separate Storage Analysis with different criteria than its Supply and Capacity Analysis.

a. GSWC's Supply and Capacity Analysis compares each zone's supply, including the supply available from storage, against the Maximum Day Demand, Peak Hour Demand, Fire Flow and unplanned outage scenarios. Why does GSWC need "specific requirements for storage volume" and the additional Storage Analysis found in Attachment C-27, pages 5-24 through 5-28?
b. Please provide the AWWA standards that GSWC used to develop its storage criteria.
c. Please provide the name, edition, and year of the AWWA publication containing the standards given in 6.b.

**Response 6:**

a. Please see Attachment C-27 Cowan Heights System Master Plan, page 5-1 section 5.1.
b. See attached "Q6.b AWWA M42 Chapter 5.pdf"
c. Name: M42 Steel Water Storage Tanks
   Edition: Revised Edition
   Year of Publication: 2013

**Question 7:**
What year did GSWC place the Peacock Hill Reservoir into service?

**Response 7:**
The Peacock Hill Reservoir was constructed in 1967 by California Cities Water Company, which GSWC acquired in 1976-77.

**Question 8:**
In "Hanford and Insco Operating District Capital Testimony," pages 203-204, GSWC requests replacing the existing 0.44 MG Hunting Horn Reservoir with a new 0.50 concrete reservoir. GSWC provided TetraTech, Inc.'s Preliminary Design Report: Structural / Seismic Evaluation of Hunting Horn Reservoir as Attachment P03.

a. How did GSWC determine that the Hunting Horn replacement should have a capacity of 0.50 MG?
b. In Attachment P03, page 16, TetraTech states that the existing Hunting Horn Reservoir "is currently in fair condition physically; however, it is far below the current design standard in terms of the minimum wall thickness, minimum reinforcing ratio, and capability to resist a design level earthquake." TetraTech subsequently gives

the option to retrofit the existing reservoir. Would the retrofit option bring the Hunting Horn Reservoir up to current design standards as defined by TetraTech?

c. In Attachment P03, pages 46-48, TetraTech estimates the capital and life cycle cost for the Hunting Horn Reservoir retrofit and replacement options. For all options, TetraTech includes a maintenance cost for 50 years. What are the expected lives (in years) of the retrofit and concrete replacement options?
d. Please explain why GSWC has requested the concrete replacement option instead of the retrofit option.

**Response 8:**

a. The standard nominal volume of 0.5 MG was determined by TetraTech as outlined in Attachment P03.
b. Yes.
c. The 50-year life span was determined by TetraTech.
d. As seen in Attachment P03, page 16, in the Reservoir Retrofit and Replacement Cost Analysis table, TetraTech ranks Option 3: 0.5 MG Circular Concrete Tank Replacement as the best option to pursue.

If you have any questions, please do not hesitate to call me at (909) 394-3600, Extension 680.

Sincerely yours,

*/s/ Jon Pierotti*

*For* Keith Switzer
Vice President – Regulatory Affairs

c: Eileen Odell, Project Lead
Victor Chan, Project Coordinator
Shanna Foley, Attorney for Public Advocates Office
Joseph Karp, Attorney for GSWC
Chris Kolosov, Attorney for GSWC
Jenny Darney-Lane, Manager of Regulatory Affairs
Jon Pierotti, Manager of Regulatory Affairs

## ATTACHMENT 3-2: GSWC RESPONSE TO PUBLIC ADVOCATES DATA REQUEST AA9-007

Golden State Water Company
A Subsidiary of American States Water Company

October 13, 2020

Anthony Andrade, Public Advocates Office
**CALIFORNIA PUBLIC UTILITIES COMMISSION**
505 Van Ness Avenue
San Francisco, CA 94102

Subject: Data Request AA9-007 (A.20-07-012) Region 3 Reservoirs II Response
Due Date: October 6, 2020 Extension Due Date October 13, 2020

Dear Anthony Andrade,

In response to the above referenced data request number, we are pleased to submit the following responses:

**Question 1:**
In its Response to the Public Advocates Office's Data Request (DR) AA9-005, Question (Q.) 5, GSWC stated:

> [The Clearview Plant] site is physically not large enough to accommodate a single tank that is large enough to meet the storage volume requirement, therefore; two tanks are required to achieve the designated storage volume.
> a. Please explain how the Clearview Plant site can accommodate GSWC's two planned reservoirs, but is at the same time, "physically not large enough to accommodate a single tank that is large enough to meet the storage volume requirement."
> b. Please express the "storage volume requirement" that GSWC refers to in its Response to DR AA9-005, Q.5, in million-gallons (MG).
> c. Please express the "designated storage volume" that GSWC refers to in its Response to DR AA9-005, Q.5, in MG.
> d. Please provide GSWC's supporting documentation, including site drawings and the feasibility analysis that show that the Clearview Plant site cannot accommodate a single reservoir that can achieve the "designated storage **volume."**

**Response 1:**

a. The dimensions of the plant site are approximately 74 feet by 144 feet. A 16-foot clear zone is required around the perimeter of the reservoir to provide access for service vehicles and to perform tank maintenance work. These constraints limit a tank diameter to 42 feet. To achieve a volume of 0.20 MG with a 42-foot diameter, the working water level within the tank (i.e. distance from invert of sidewall outlet pipe to water overflow level) is 20–feet, resulting in an overall tank height of 30 feet from the site elevation to top of tank vent. Two new 0.10 MG reservoirs, each 40-feet in diameter, would require a working height of 10 feet, resulting in an overall tank height of 20 feet. Please see the attached file "Q1.d Clearview Site Plan.pdf".

   The Clearview Plant is located in an established residential neighborhood adjacent to large single-family homes. It would be very difficult, if not impossible, to obtain an approval from the Orange County Planning Commission to construct a 30-foot tall steel tank in this mature neighborhood, since the tank would be considerably taller than the adjacent homes. Golden State Water proposes constructing two 20-foot tall steel tanks as they are similar in height to the neighboring homes. Additionally, two tanks will allow us to take one tank out of service for maintenance without impacting our ability to maintain water service.

b. The "storage volume requirement" is 0.20 MG. Each of the two tanks would be 0.10 MG in size.

c. The "designated storage volume" is 0.20 MG. Each of the two tanks would be 0.10 MG in size.

d. Please see the attached file "Q1.d Clearview Site Plan.pdf".

**Question 2:**

In "PCE_RIII – Claremont (Padua Plant, Improve and Recoat Reservoir).xlsx," tab "Construction Cost," row 20, GSWC identifies a $50,000 project item as "Structural repairs – rafters and center supports."

  a. Why do the Padua Reservoir's rafters and center supports need structural repairs?

  b. How will GSWC's planned structural repairs improve the Padua Reservoir's rafters and center supports?

**Response 2:**

a. As mentioned in Attachment CM02 - Claremont - Padua Tank Inspection, page 7, DIVE/CORR, Inc. mentions rust and the deterioration of the roof underside. GSWC proposes to remedy these issues during the recoating process.

b. GSWC structural repairs will address the rust and deterioration of the roof's underside.

**Question 3:**

In "Hanford and Insco Operating District Capital Testimony," page 265, GSWC requests authorization to include in rates funding for installing seismic couplings at the Lenwood

Reservoir and for providing temporary storage while the reservoir is out-of-service. However, in "PCE_RIII – Barstow (Lenwood Seismic Coupling).xlsx," tab "Construction Cost," GSWC adds tank recoating, epoxy coating, and a new cathodic protection system to the project cost estimate.

a. Does GSWC explain the need for tank recoating, epoxy recoating and a new cathodic protection system at the Lenwood Reservoir in the current application?
b. If no to 3.a above, please explain the need for the three items.

**Response 3:**

a. Please refer to the attached file, "Q3.a Lenwood Tank Inspection 2017.pdf", by DIVE/CORR, Inc. On page 9 of this file, recommendation 3, states the roof underside and above water wall coating are in poor condition and should be re-coated as soon as funds are available.
b. See response to 3a.

**Question 4:**

In "Hanford and Insco Operating District Capital Testimony," pages 299-300, GSWC requests a land acquisition for a future reservoir in the Desert View system. In "PCE_RIII – Desert View (Desert View, Land Acquisition for New Storage Facility).xlsx," tab "Construction Cost," GSWC identifies a $30,000 estimate to pay a consultant to locate land and a $200,000 estimate to acquire the land.

a. What is the area in square feet of the Desert View Plant site where the wells supplying the system are located?
b. Can GSWC construct a new reservoir on the existing Desert View Plant site?
c. Why does GSWC need to hire a consultant to locate land in the Desert View system?
d. How did GSWC determine the $30,000 consultant fee estimate?
e. How did GSWC determine the $200,000 land acquisition estimate?

**Response 4:**

a. The area of the Desert View Plant site is 295,193 square feet.
b. The Desert View water system has a hydraulic grade line of 3,300 feet. The Desert View plant site has a base elevation of 3,158 feet. A reservoir can be constructed at the Desert View plant site, but to match the existing hydraulic grade line of the system a new booster station would also need to be installed. A new off-site reservoir located at the proper elevation would eliminate the need for a new booster station.
c. A land use consultant would have the expertise that GSWC lacks, to perform an environmental constraints analysis for appropriate parcels that will minimize environmental review and regulation. This approach would be similar to one used for the Orcutt Reservoir Land Acquisition project, work order number 15931342. Please refer to the attached file "Q4.c SWCA Environmental Scope - 15931342.pdf".
d. The SWCA scope of services referenced above in 4c was estimated at $19,650 in 2018. GSWC increased the estimated cost to $30,000 to account for the geographic remoteness of the proposed study area.

e. A one-acre parcel would be suitable for the new tank site and appurtenances. However, GSWC has yet to determine what access easements or additional parcel acquisitions could be required to obtain secure access to the new tank site parcel. GSWC was also unsure of the exact size of existing parcels that may be available and at the correct elevation and realized it may have to acquire an existing parcel larger than the minimum size required for just the tank site. GSWC budgeted one dollar per square foot for 200,000 square feet to provide for these contingencies.

**Question 5:**
In "Hanford and Insco Operating District Capital Testimony," pages 312-313, GSWC requests a 0.2 MG replacement for the Sheep Creek Reservoir and 1,050 feet of 12-inch pipeline. In "PCE_RIII – Wrightwood (Sheep Creek Reservoir).xlsx," tab "Construction Cost," row 14, GSWC identifies a $300,000 estimate for a permit from the United States Forestry Service (USFS).

a. Why does GSWC need the requested permit from the USFS?
b. Has GSWC begun the USFS permit application process? If so, what is the status of the application?
c. Please provide the date when GSWC submitted (or plans to submit) the permit application, and the date when GSWC expects to receive the permit.
d. How did GSWC determine the $300,000 cost estimate for the USFS permit? If available, provide supporting documentation for this estimate.

**Response 5:**

a. See response to "d." below.

b. See response to "d." below.

c. See response to "d." below.

d. In the previously submitted file, "PCE_RIII – Wrightwood (Sheep Creek Reservoir).xlsx", tab "Construction Cost," row 14, GSWC identified a $300,000 estimate for a permit from the United States Forest Service (USFS). This item was inadvertently mislabeled as "Permit from US Forest Service". Row 14 should be labeled "Construct New Inlet/Outlet Piping" and is the estimated construction cost of the 1,050 lineal feet of 12-inch PVC Pipeline as indicated in the same file, "Front Sheet" tab, in the Project Description section, row 26.

   A revised PCE with this correction is attached as file "Q5.d PCE_RIII – Wrightwood (Sheep Creek Reservoir) Rev 1.xlsx" to this response.

If you have any questions, please do not hesitate to call me at (909) 394-3600, Extension 680.

Sincerely yours,

Jon Pierotti

Digitally signed by Jon Pierotti
DN: cn=Jon Pierotti, o=GSWC, ou=Regulatory Affairs, email=jon.pierotti@gswater.com, c=US
Date: 2020.10.13 13:33:25 -07'00'

For Keith Switzer
Vice President – Regulatory Affairs

c: Eileen Odell, Project Lead
Victor Chan, Project Coordinator
Shanna Foley, Attorney for Public Advocates Office
Joseph Karp, Attorney for GSWC
Chris Kolosov, Attorney for GSWC
Jenny Darney-Lane, Manager of Regulatory Affairs
Jon Pierotti, Manager of Regulatory Affairs

## ATTACHMENT 3-3: COUNTY OF ORANGE GENERAL PLAN, CHAPTER X HOUSING ELEMENT, TABLE X-35: SUMMARY OF RESIDENTIAL ZONING REGULATIONS

Note: Cal Advocates provides this excerpt of Table X-35 for greater visibility of column "Height Limit." The complete Table X-35 is publicly available on the web.[175]

**CHAPTER X – HOUSING ELEMENT**

**Table X-35**
**Summary of Residential Zoning Regulations –**
**County of Orange**

| Zone | Residential Uses Permitted By Right | Residential Uses Permitted With SDP/UP | Min. Land Area per Unit/Max. Density | Height Limit | From Ultimate Street R/W Line | | | From Property Line Not Abutting Street | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Front | Side | Rear | Side | Rear |
| AR "Agricultural Residential" | • Community care facilities serving six (6) or fewer persons and large family day care homes<br>• Single-family detached dwelling or mobile home per section 7-9-149.5 (one building site) | | 4 acres/ 0.25 du/ac | 35 ft. | 20 | 5 | 25 | 5 | 25[4] |
| E1 "Estates" District | • Community care facilities serving six (6) or fewer persons and large family day care homes<br>• Single-family dwelling or mobile home per section 7-9-149.5 (one per building site) | | 1 acre/ 1.0 du/ac | 35 ft. | 45 | 20 | 50 | 20 | 50[4] |
| RHE "Residential Hillside Estates" District | • Community care facilities serving six (6) or fewer persons and large family day care homes<br>• Single-family dwelling or mobile home per section 7-9-149.5 (one per building site) | | 10,000 sq.ft./ 4.3 du/ac | 35 ft. | 10 | 8 | 25 | 8 | 25[4] |
| E4 "Small Estates" District | • Community care facilities serving six (6) or fewer persons and large family day care homes<br>• Single-family dwelling or mobile home per section 7-9-149.5 (one per building site) | | 10,000 sq.ft./ 4.3 du/ac | 35 ft. | 30 | note[1] | 25 | note[1] | 25[4] |
| RE "Residential Estates District | • Community care facilities serving six (6) or fewer persons and large family day care homes<br>• Single-family dwelling or mobile home per section 7-9-149.5 (one per building site) | | 20,000 sq.ft./ 2.2 du/ac | 35 ft. | 40 | note[1] | 25 | note[1] | 25[4] |

December 10, 2013

[175] County of Orange General Plan, Chapter X Housing Element. Web. https://www.ocgov.com/civicax/filebank/blobdload.aspx?blobid=33606#page=57.

| Zone | Residential Uses Permitted By Right | Residential Uses Permitted With SDP/UP | Min. Land Area per Unit/Max. Density | Height Limit | From Ultimate Street R/W Line | | | From Property Line Not Abutting Street | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Front | Side | Rear | Side | Rear |
| R1 "Single-Family Residence" District | • Community care facilities serving six (6) or fewer persons and large family day care homes<br>• Single-family dwelling or mobile home per section 7-9-149.5 (one per building site) | | 7,200 sq.ft./ 6.1 du/ac | 35 ft. | 20 | 5 | 25 | 5 | 25[4] |
| RS "Residential, Single-Family District" | • Community care facilities serving six (6) or fewer persons and large family day care homes<br>• Single-family dwelling or mobile home per section 7-9-149.5 (one per building site) | | 7,000 sq.ft./ 6.2 du/ac | 35 ft. | 10 | 10 | 10 | note[3] | 0 |
| R2D "Two-Family Residence" District | • Community care facilities serving six (6) or fewer persons and large family day care homes<br>• Duplexes (one per building site)<br>• Single-family dwelling or mobile home per section 7-9-149.5 (one per building site) | • Residential condominium, stock cooperative, and community apartment projects per section 7-9-147 (two units maximum) | 3,600 sq.ft./ 12.1 du/ac | 35 ft. | 20 | 5 | 25 | 5 | 25[4] |
| R2 "Multifamily Dwelling" District | • Community care facilities serving six (6) or fewer persons and large family day care homes<br>• Multi-family projects of four (4) or less dwelling unit<br>• Single-family dwelling or mobile home per section 7-9-149.5 (one per building site) | • Multi-family projects of five (5) or more dwelling units (except condominium, stock cooperative, and community apartment projects) per section 7-9-146.7<br>• Mobile home developments per section 7-9-149<br>• Residential condominium, stock cooperative, and community apartment projects per section 7-9-146.7<br>• Residential planned (unit) developments per site development standards of section 7-9-110 | 1,000 sq.ft./ 43.5 du/ac | 35 ft. | 20 | 5 | 25 | 5 | 25[4] |

| Zone | Residential Uses Permitted By Right | Residential Uses Permitted With SDP/UP | Min. Land Area per Unit/Max. Density | Height Limit | From Ultimate Street R/W Line | | | From Property Line Not Abutting Street | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Front | Side | Rear | Side | Rear |
| R3 "Apartment" District | • Boarding houses serving six (6) or fewer persons<br>• Community care facilities serving six (6) or fewer persons and large family day care homes<br>• Multi-family projects of four (4) or less dwelling unit<br>• Single-family dwelling or mobile home per section 7-9-149.5 (one per building site) | • Fraternity or sorority houses<br>• Multifamily projects of five (5) or more dwelling units (except condominium, stock cooperative, and community apartment projects) per section 7-9-146.7<br>• Congregate care facilities<br>• Mobile home developments per section 7-9-149<br>• Residential condominium, stock cooperative and community apartment projects per section 7-9-146.7<br>• Residential planned (unit) developments per site development standards of section 7-9-110<br>• Boarding houses serving more than 6 persons. | 1,000 sq.ft./ 43.5 du/ac | 65 ft. | 20 | note[2] | 25 | note[2] | 25[4] |
| R4 "Suburban Multifamily Residential" District | • Community care facilities serving six (6) or fewer persons and large family day care homes<br>• Multi-family projects of four (4) or less dwelling unit<br>• Single-family dwelling or mobile home per section 7-9-149.5 (one per building site) | • Multifamily projects of five (5) or more dwelling units (except condominium, stock cooperative, and community apartment projects) per section 7-9-146.7<br>• Congregate care facilities<br>• Mobile home developments per section 7-9-149<br>• Residential condominium, stock cooperative and community apartment projects per section 7-9-146.7<br>• Residential planned (unit) developments per site development standards of section 7-9-110 | 3,000 sq.ft./ 14.5 du/ac | 35 ft. | 20 | 5 | 25 | 5 | 25[4] |
| RP "Residential-Professional" | • Community care facilities serving six (6) or fewer persons and large family day care homes<br>• Single-family dwelling or mobile home per section 7-9-149.5 (one per building site) | • Multifamily projects of four (4) or less dwelling units | 3,000 sq.ft./ 14.5 du/ac | 35 ft. | 20 | 5 | 25 | 5 | 25[4] |

**ATTACHMENT 3-4: GSWC RESPONSE TO PUBLIC ADVOCATES DATA REQUEST AA9-011**

Golden State
Water Company
A Subsidiary of American States Water Company

October 15, 2020

Anthony Andrade, Public Advocates Office
**CALIFORNIA PUBLIC UTILITIES COMMISSION**
505 Van Ness Avenue
San Francisco, CA 94102

Subject: Data Request AA9-011 (A.20-07-012) Region 3 Booster Stations Response
Due Date: October 16, 2020

Dear Anthony Andrade,

In response to the above referenced data request number, we are pleased to submit the following responses:

The following data requests are a follow up to the 10/2/2020 meeting between the Public Advocates Office and GSWC.

**Question 1:**
In "Hanford and Insco Operating District Capital Testimony" (Capital Testimony), pages 204-205, GSWC states that it should replace the existing booster pump at the Concerto Booster Pump Station (BPS). On page 205, line 12, GSWC states that the existing booster "is reaching the end of its useful life."

a. How did GSWC determine that the existing booster is reaching the end of its useful life?
b. How old is the existing Concerto booster?
c. Please provide the results of the most recent efficiency test for the existing Concerto booster.
d. Has the existing Concerto booster failed? If yes, please provide the repair record for each failure.
e. Please complete the following table by providing the number of hours that the existing Concerto booster has been operational.

| Year | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|
| Hours of Operation | | | | | |

**Response 1:**

a. In the 2020 Concerto Booster A pump test, attached as "Q1.a 2020 Concerto BP A Efficiency Test.pdf", the overall efficiency of this pump station was determined to be 47% and 46%. According to the attached file "Q1.a CPUC pump efficiency memo 1978.pdf", for a 50 HP pump, the overall efficiency for this pump is in the "Low" tier. Due to the reduced pump performance and low pump efficiency GSWC has determined that the pump is at the end of its useful life.
b. Concerto Booster A was installed in 2009.
c. Please see attached "Q1.a 2020 Concerto BP A Efficiency Test.pdf".
d. No.
e. Please refer to the table below.

| Year | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|
| Hours of Operation | 2368.2 | 3099.1 | 4142.6 | 4564.9 | 2160.7 |

**Question 2:**

In "PCE_RIII – Yorba Linda (Concerto Booster Pump).xlsx," tab "Construction Cost," row 14, GSWC includes a $200,000 cost estimate for a new 500-square foot (SF) BPS building.

a. Why does the Concerto BPS need a new building?
b. How did GSWC determine that it should use a $400 per SF unit cost for the new Concerto BPS building? Provide any documents relied on in the formulation of this estimate.
c. How did GSWC determine that the BPS building should have a size of 500 SF?

**Response 2:**

a. Currently, the existing booster pump is located in a 3-foot by 5-foot wooden enclosure. The wooden enclosure is in poor condition and needs to be replaced. Also the new booster building will offer better sound attenuation. Please see a 2019 photograph attached as "Q2.a Concerto BPS Wooden Enclosure.pdf".
b. A company-wide building cost comparison was performed and GSWC used a conservative cost estimate when estimating the cost of the new booster building. Please see attached "Q2.b Building Cost Comparison.pdf".

c. In addition to housing the new booster station, the booster building will also be housing the new MCC and PLC panels. The building size was estimated to provide suitable operational access and compliance with building and electrical codes.

**Question 3:**
In its Capital Testimony, pages 206-207, GSWC states its plan to relocate the pressure regulating valve (PRV) on Fairmont Blvd across the street to the Fairmont Booster Pump Station (BPS). On page 207, lines 6-7, GSWC states that the Fairmont BPS and PRV "work in tandem with each other making it critical that operators have safe and efficient access to both facilities." On the same page 207, lines 9-10, GSWC states that its operators have to walk across Fairmont Blvd to access both sites.

a. When were the existing Fairmont Oak Meadow PRV and Fairmont BPS installed?
b. Why was the Fairmont Oak Meadow PRV not installed at the Fairmont BPS location originally?
c. How often do GSWC operators visit the Fairmont facilities?
d. How does GSWC currently instruct its operators to safely access both facilities?
e. Can GSWC operators drive from the Fairmont Oak Meadow PRV to the Fairmont BPS and work on them as if they were visiting two different sites?
f. Please provide photos of the Fairmont BPS.
g. Please provide aerial photos or site drawings illustrating the relative locations of the Fairmont Oak Meadow PRV, the Fairmont BPS, and the nearest crosswalk.

**Response 3**

a. The booster pump station was constructed in 1993 and the PRV station was constructed 1972.
b. The facilities were installed under separate projects 21 years apart with the PRV installed first. There was not sufficient space to construct the Fairmont BPS on the same side of the street as the PRV.
c. GSWC operators visited the Fairmont BPS on a daily basis. The Fairmont Oak Meadow PRV is accessed for maintenance and to make system adjustments as needed depending on system demands and operational objectives.
d. GSWC instructs its operators to have all vehicles parked parallel to the street curb adjacent to the facilities, utilize emergency flashers, overhead lights and setting traffic cones for additional visibility and safety.
e. Yes
f. Please see attached "Q3.f Fairmont Booster Pump Station.pdf".
g. Please see attached "Q3.g Fairmont BPS Aerial.pdf".

If you have any questions, please do not hesitate to call me at (909) 394-3600, Extension 680.

Sincerely yours,

Jon Pierotti

Digitally signed by Jon Pierotti
DN: cn=Jon Pierotti, o=GSWC, ou=Regulatory Affairs, email=jon.pierotti@gswater.com, c=US
Date: 2020.10.15 08:13:10 -07'00'

For Keith Switzer
Vice President – Regulatory Affairs

c: Eileen Odell, Project Lead
Victor Chan, Project Coordinator
Shanna Foley, Attorney for Public Advocates Office
Joseph Karp, Attorney for GSWC
Chris Kolosov, Attorney for GSWC
Jenny Darney-Lane, Manager of Regulatory Affairs
Jon Pierotti, Manager of Regulatory Affairs

# ATTACHMENT 3-5: GSWC CONCERTO BPS SITE PHOTOGRAPHS

**ATTACHMENT 3-6: GSWC RESPONSE TO PUBLIC ADVOCATES DATA REQUEST AA9-017**

Golden State
Water Company
A Subsidiary of American States Water Company

January 11, 2021

Anthony Andrade, Public Advocates Office
**CALIFORNIA PUBLIC UTILITIES COMMISSION**
505 Van Ness Avenue
San Francisco, CA 94102

Subject: Data Request AA9-017 (A.20-07-012) Region 3 Pump Noise Response
Due Date: January 11, 2021

Dear Anthony Andrade,

In response to the above referenced data request number, we are pleased to submit the following responses:

**Question 1:**

Has GSWC received any complaints that pump noise is too loud from residents neighboring the following plant sites:

a. Concerto in the Placentia-Yorba Linda system,
b. Indian Hill North in the Claremont system, and
c. Bear Valley in the Barstow system

**Response 1:**

a. No noise complaints have been documented from neighboring residents of the Concerto plant site in the Placentia-Yorba Linda System.
b. No noise complaints have been documented from neighboring residents of the Indian Hill North project in the Claremont system.
c. No noise complaints have been recorded for the Bear Valley site in Barstow.

**Question 2:**
If GSWC responded “yes” to question 1.a, b, or c, please provide records showing the number of complaints for each of the three sites in the last 10 years. Please include the date of each complaint in the records provided. If residents submitted written complaints, please provide copies of such complaints and include the date the complaint was made.

**Response 2:**
Not applicable given the responses to Question 1.

If you have any questions, please do not hesitate to call me at (909) 394-3600, Extension 680.

Sincerely yours,

Jon Pierotti
Digitally signed by Jon Pierotti
DN: cn=Jon Pierotti, o=GSWC, ou=Regulatory Affairs, email=jon.pierotti@gswater.com, c=US
Date: 2021.01.11 07:11:43 -08'00'

For Keith Switzer
Vice President – Regulatory Affairs

c: Eileen Odell, Project Lead
Victor Chan, Project Coordinator
Shanna Foley, Attorney for Public Advocates Office
Joseph Karp, Attorney for GSWC
Chris Kolosov, Attorney for GSWC
Jenny Darney-Lane, Manager of Regulatory Affairs
Jon Pierotti, Manager of Regulatory Affairs

**ATTACHMENT 4-1: GSWC RESPONSE TO PUBLIC ADVOCATES DATA REQUEST AA9-012**

Golden State
Water Company
A Subsidiary of American States Water Company

October 16, 2020

Anthony Andrade, Public Advocates Office
**CALIFORNIA PUBLIC UTILITIES COMMISSION**
505 Van Ness Avenue
San Francisco, CA 94102

Subject: Data Request AA9-012 (A.20-07-012)
Region 3 Booster Stations II Response
Due Date: October 16, 2020

Dear Anthony Andrade,

In response to the above referenced data request number, we are pleased to submit the following responses:

The following data requests are a follow up to the 10/2/2020 meeting between the Public Advocates Office and GSWC.

**Question 1:**
In "Hanford and Insco Operating District Capital Testimony" (Capital Testimony), pages 221-222, GSWC states that it plans to replace the booster pumps, booster pump station (BPS) building, and piping at the Del Monte Plant. On page 222, line 4, GSWC states that it plans to "modify one pump to pump into Lower Zone to save energy." On the same page 222, lines 10-11, GSWC states that it plans to install an additional pump to supply the Lower Zone.

a. If GSWC can "modify one pump" to pump into the Lower Zone as it states on page 222, line 4, why does it need to install an additional pump?
b. Can the existing BPS building accommodate the additional pump? If no, explain why not.
c. How did GSWC determine that the Del Monte BPS building has exceeded its useful life?
d. Please provide original documents showing the most recent pump test data for the Del Monte boosters.

e. Have the Del Monte boosters A, B, and C failed? If yes, please provide the repair record for each failure.

**Response 1:**

a. All three Del Monte boosters at our existing booster station are suppling the Main Zone. Booster A with a design flow of 1,100 gpm, is primarily used for high and fire flow demands. Boosters B and C with a design flow of 700 gpm, are used for normal operating demands. GSWC proposes to continue operating the Main Zone with a three-booster station configuration. The fourth booster will be used to supply the Lower Zone for distribution efficiency as outlined in the 2019 Claremont Master Plan.
b. Yes, it can accommodate the additional pump.
c. The exact age of the booster building is unknown. However, there is a 1949 site as-built plan showing the building as existing. This building is constructed of brick with stucco facing. There are as-built plans showing minor restoration work to the building in 1959. Since 1959 there are no plans indicating any structural upgrades to the building. Some of the bricks have become loose due to the deteriorated mortar.
d. See the attached file "Q.1d Pump Tests.pdf"
e. Booster A has failed. As Booster A is currently out of service, no repair records exist. Booster B and C have not failed and are operational.

**Question 2:**

In "PCE_RIII – Claremont (Del Monte Plant, Replace Booster Station).xlsx," tab "Construction Cost," row 14, GSWC includes a $600,000 estimate for a BPS building. The estimate is calculated with a 2019 unit cost of $300 per square foot (SF).

a. How did GSWC determine that it should use a $300 per SF unit cost for the new Del Monte BPS building? Provide any source documents used in the formulation of this estimate.
b. How did GSWC determine that the new Del Monte BPS building should have an area of 2,000 SF?

**Response 2:**

a. A company-wide building cost comparison was performed and GSWC used a conservative cost estimate when estimating the cost of the new booster building. Please see the attached file "Q2.a Building Cost Comparison.pdf".
b. The existing booster station building is a 35-foot by 45-foot building (1,575 SF), which houses three boosters and the MCC and PLC panels for the Del Monte Booster Station. We propose to increase the size of the new building, from the existing building's foot print, to allow easier access for maintenance and repairs on the equipment.

**Question 3:**
In its Capital Testimony, pages 223-224, GSWC states that it plans to construct a new BPS building, and replace three existing booster pumps, a chemical building, and a well pump house at the Indian Hill North Plant.

a. On page 223, lines 22-24, GSWC gives the efficiencies of boosters C, D, and E and the ages of boosters A, B, and C. Please provide the ages of boosters D and E. Also, explain if boosters A and B are operational.
b. Please provide supporting documentation showing the 2019 pump test data.
c. Have the Indian Hill North boosters C, D, and E failed? If yes, please provide the repair record for each failure.
d. During the site visit, the Public Advocates Office's staff found that the Indian Hill North Plant was at a different address than 3039 North Indian Hill Blvd, Claremont, CA. What is the address of the Indian Hill North Plant?
e. Please provide a site drawing showing the location of the planned BPS replacement.
f. Has a service truck been able to access the Indian Hill North well pumps and motors?
g. Does the City of Claremont require that GSWC house its booster pumps inside buildings?

**Response 3**

a. Booster D is 50 years old, and Booster E is 12 years old. Boosters A and B are not operational as Boosters C, D, & E are the only existing boosters.
b. Please see the attached file, "Q3.b 2019 pump tests.pdf".
c. There is no record of a Booster D failure. The Booster C motor was replaced in 2001, and the Booster E pump and motor were replaced in 2008. The repair records for Booster C and E are attached as file "Q3.c Booster C & E repair invoices.pdf", and describe the replacement of seals and impellors.
d. The correct address is 2273 N. Indian Hill Blvd., Claremont, CA.
e. Please see the attached file "Q3.e Indian Hill North Site Plan – Proposed.pdf".
f. Yes, a service truck has been able to access the Indian Hill North well pumps and motors.
g. No, they do not.

**Question 4:**
In "PCE_RIII – Claremont (Indian Hill North, Replace Booster Station).xlsx," tab "Construction Cost," row 18, GSWC includes a $420,000 estimate for a BPS building. How did GSWC determine that the new Indian Hill North BPS building should have an area of 1,400 SF?

**Response 4**

To accommodate four booster pumps, appurtenances, electrical and SCAD equipment, GSWC has estimated the new Indian Hill North BPS building should have an area of 1,400 square feet. This calculates to dimensions of approximately 19 feet by 75 feet.

If you have any questions, please do not hesitate to call me at (909) 394-3600, Extension 680.

Sincerely yours,

Jon Pierotti

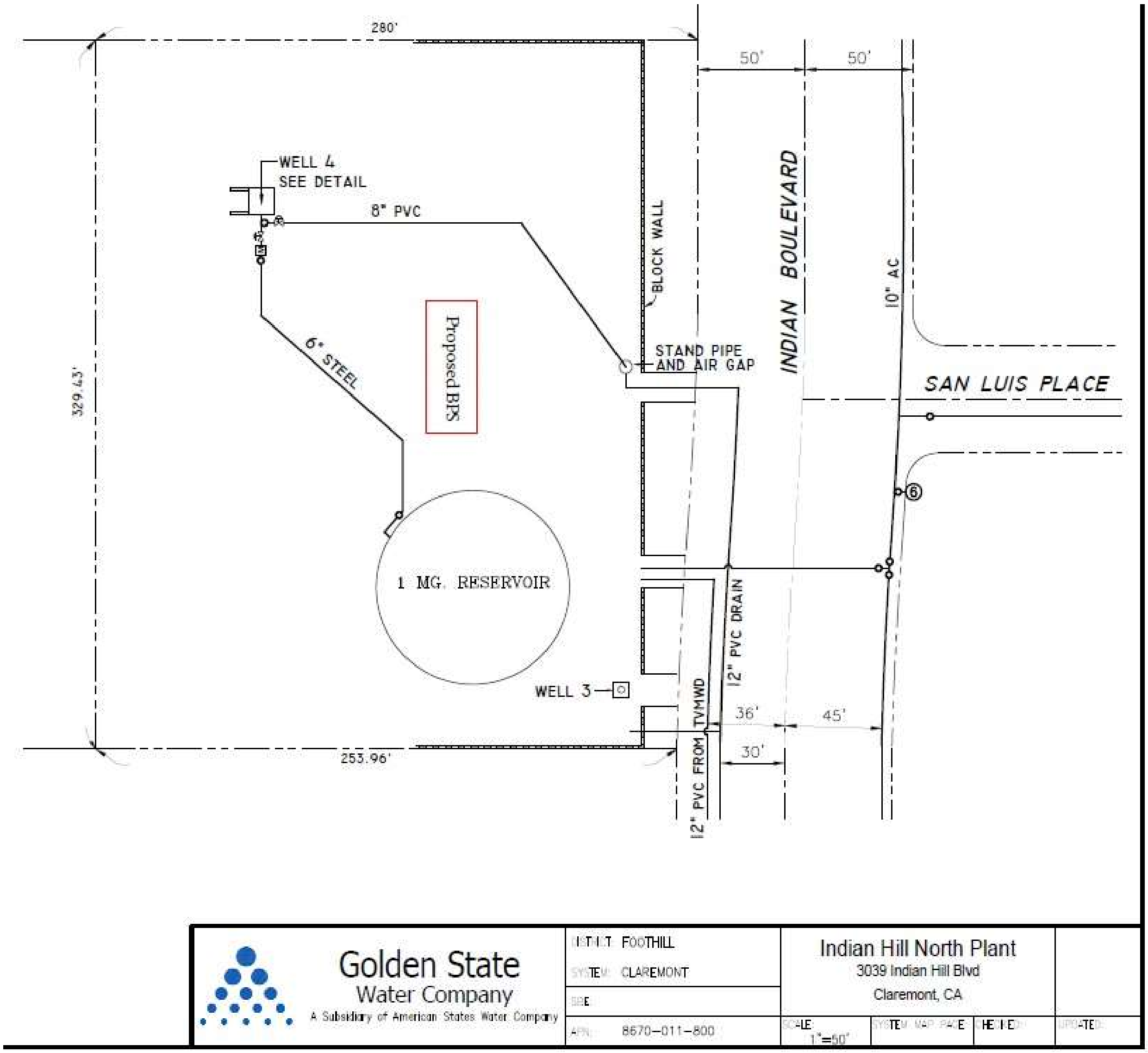
Digitally signed by Jon Pierotti
DN: cn=Jon Pierotti, o=GSWC, ou=Regulatory Affairs, email=jon.pierotti@gswater.com, c=US
Date: 2020.10.16 16:29:23 -07'00'

For Keith Switzer
Vice President – Regulatory Affairs

c: Eileen Odell, Project Lead
Victor Chan, Project Coordinator
Shanna Foley, Attorney for Public Advocates Office
Joseph Karp, Attorney for GSWC
Chris Kolosov, Attorney for GSWC
Jenny Darney-Lane, Manager of Regulatory Affairs
Jon Pierotti, Manager of Regulatory Affairs

GSWC Response to Public Advocates Data Request AA9-012, Attachment Q.3e

Note: Cal Advocates provides this excerpt of Attachment Q.3e for greater visibility.



**ATTACHMENT 4-2: REPOINTING (TUCKPOINTING) BRICK MASONRY. BRICK BRIEF.**

THE BRICK INDUSTRY ASSOCIATION

# Brick Brief

July 2005

## REPOINTING (TUCKPOINTING) BRICK MASONRY

### Introduction

The terms pointing, repointing and tuckpointing are often used interchangeably, which has led to confusion within the masonry industry. For years, the Brick Industry Association has used the term "tuck-pointing" to describe one form of maintenance of brick masonry. However, the meaning of tuckpointing may vary by geographical region, leading to conflicts regarding job specifications and expected repairs. Recently these terms have been defined in ASTM E 2260, Guide for Repointing (Tuckpointing) Historic Masonry, as follows:

**Point** - placing mortar into a properly prepared joint

**Repointing** - the process of removal of defective mortar from between masonry units and placement of fresh mortar.

ASTM E 2260 defines tuckpointing as synonymous with repointing, however the term also applies to an older practice of pointing masonry with a flush mortar joint that approximates the color of the masonry units and a mortar of contrasting color that is shaped into a thin strip, giving the appearance of a very thin mortar joint.

This *Brick Brief* covers the process that ASTM E 2260 defines as repointing. Thus the term repoint is used throughout to avoid confusion.

### Why Repoint?

The longevity of mortar joints will vary with the exposure conditions and the mortar materials used. A lifespan exceeding 25 years is typical for mortar joints. The longevity of brick units, however, may well exceed 100 years. Consequently, occasional repair of the mortar joints may be necessary over the life of the brick masonry. The most common reason for repointing brick masonry is to improve water penetration resistance. Repointing deteriorated mortar joints is one of the most effective and permanent ways of decreasing water entry into brickwork. This is because a common means of water entry into a brick masonry wall is through debonded, cracked or deteriorated mortar joints.

### What to Repoint

A critical step in the repointing operation is to identify wall areas that require repointing. This step is critical because only defective joints require repair. Repointing is very labor-intensive work and original mortar joints in good condition are preferable to repointed mortar joints. Conditions that require repointing include:

- mortar erosion exceeding $^1/_4$ in. (6.4 mm.)
- crumbling mortar
- mortar with voids
- hairline cracks in the mortar
- cracks between the brick and mortar.

Visual observation in combination with light scraping with a metal tool can detect cracked, spalled and friable mortar joints. This is the most common means of determining areas to be repointed. On older buildings, "cleaning" by low or moderate pressure water wash (not grit or chemical wash) may be required prior to evaluating the condition of existing mortar joints. Consult *Technical Note* 20 for proper water washing techniques. Care should be taken to not cause further damage to the brickwork when cleaning.

### Repointing Mortar

The strength, composition and color of the existing mortar should be considered when selecting a repointing mortar.

**Strength.** To avoid irreparable brick damage, the compressive strength of the repointing mortar should be similar to or weaker than the compressive strength of the original mortar. Under load, a stronger repointing mortar will deform less than a weaker original mortar, causing the load to be concentrated on the thin strip of stronger repointing mortar. This stress concentration can lead to spalling of the brick face. The brick masonry is loaded by its self-weight and any externally applied loads present. In addition, the brick masonry is subjected to internal loads due to its thermal expansions and contractions and the shrinkage of the repointing mortar.

Matching compressive strengths of the original and the repointing mortar may be done by matching mortar material proportions. By petrographic or chemical analysis, it is possible to analyze a sample of the original mortar and determine proper proportions of components. ASTM C 1324, Standard Test Method for Examination and Analysis of Hardened Masonry Mortar, can be used to determine the mortar proportions. However, such testing is an added cost, typically only appropriate for historic structure repointing projects which are required to closely match existing conditions. Rather than extensive testing, simply considering the age of the building will give a strong indication of the main contents of the original mortar. For example, mortar containing portland cement was not used in brickwork until after the turn of the twentieth century. Until that time, a common lime and sand mortar in one to three proportions was clearly the most frequently used brick masonry mortar.

**Composition.** Typically, repointing mortar will be Type N, O or K mortar. The proportions of portland cement and lime for Types N and O mortars should be in accordance with ASTM C 270, Standard Specification for Mortar for Unit Masonry or BIA M1-88 (see *Technical Note* 8A). Type K mortar proportions are no longer included in the body of ASTM C 270, but are given in an appendix on repointing. Mortar specifications permit a range of proportions of materials for each type of mortar. However, the following are typical proportions by volume :

- Type N - 1 part portland cement, 1 part hydrated lime, and 6 parts sand
- Type O - 1 part portland cement, 2 parts hydrated lime, and 9 parts sand
- Type K - 1 part portland cement, 4 parts hydrated lime and 15 parts sand

In some cases, it may be necessary to match sand gradation with that in the original mortar. For example, brick masonry constructed with thin mortar joints may require sand with finer maximum particle size than permitted by ASTM C 144, Standard Specification for Aggregate for Masonry Mortar. A matching sand gradation may be determined by analysis of the original mortar. The color of the sand to a large extent influences the mortar color since it is the most prevalent of the mortar constituents. Local sand suppliers should be contacted to match sand color. Water for repointing mortar should be clean and potable and should be free of deleterious amounts of acids, alkalies or organic materials.

**Additives.** In general, the use of chemical additives in the repointing mortar mix should be avoided. However, in many older buildings, the original mortar may contain additional materials such as oyster shells and horsehair. If duplication of the original mortar is required, the repointing mortar should contain these materials in matching quantities. Oyster shells, if required, should be thoroughly washed and rinsed with clear water to remove all traces of salt and biological growth. The oyster shells should be crushed to a size matching that in the original mortar. To avoid detriment to the repointing mortar performance, the quantity of oyster shells should not exceed 2 parts by volume of the mix.

Coloring of the mortar with pigments may be required to match the original mortar color. Pigments should be metallic oxides and not organic chemicals. Coloring additives may be added to the mix in quantities not to exceed 10 percent by weight of the portland cement in the mix, with carbon black limited to 2 percent. When matching an existing mortar compare the mixed sample to existing mortar that has been wetted and then compare fully dried samples.

## Mortar Preparation and Placement

The repointing mortar should be prepared and placed in accordance with the procedures given in *Technical Note* 7F and the repointing appendix of ASTM C 270. Prehydration of the repointing mortar is a very important step in the process, as prehydration helps avoid excessive shrinkage of the repointing mortar. Removal of defective mortar and cleaning of the joint prior to repointing are necessary for successful performance of the repointing mortar. The depth of mortar removal should equal or exceed two times the mortar joint thickness. Proper layering and compaction of the repointing mortar helps develop bond with the adjacent brick and mortar. ASTM E 2260, Standard Guide for Repointing (Tuckpointing) Historic Masonry, provides further information on preparing and repointing mortar joints.

## Locating a Quality Repointer

An important step toward a successful repointing job is to secure a qualified and experienced repointing craftsman. An individual who is an excellent mason/bricklayer may not be skilled in repointing. It is suggested that skills be substantiated by prior repointing projects or by prequalifying. One method of evaluating craftsmanship is to designate an inconspicuous section of the brick masonry and allow candidates to demonstrate their work. The skills in question are:

- cutting out the mortar joints to the proper depth and profile with minimal damage to adjacent brick
- proper preparation of the mortar for repointing
- proper placement of mortar by layering, compacting and tooling
- accurate color matching to adjacent, original mortar joints.

Cleanliness of the repointing operation is also important, so that extensive cleaning of the finished wall is not necessary.

## Summary

These recommendations are necessarily general in nature to address the many scenarios for which repointing may be required. The application of these recommendations should be done with skill and engineering judgment. Where repointing work on structures of artistic, architectural, cultural or historical significance is considered, guidance from a preservation specialist should be sought.

# ATTACHMENT 4-3: TECHNIQUES FOR THE SEISMIC REHABILITATION OF EXISTING BUILDINGS, PREFACE

# Techniques for the Seismic Rehabilitation of Existing Buildings

## FEMA 547 – October 2006

Prepared by:
Rutherford & Chekene (R & C) Consulting Engineers (Subconsultant) under contract with National Institute of Standards and Technology (NIST).

Project funding was provided by the Federal Emergency Management Agency (FEMA) through an Interagency Agreement - EMW-2002-IA-0098 with the National Institute of Standards and Technology (NIST).

Additional funding was provided by the following agencies:

General Services Administration (GSA)
Air Force Civil Engineer Support Agency (AFCESA)
Naval Facilities Engineering Command (NAVFAC)
U.S. Bureau of Reclamation (USBR)

## Notice

Any opinions, findings, conclusions, or recommendations expressed in this publication do not necessarily reflect the views of the Federal Emergency Management Agency, the General Services Administration (GSA), the Air Force Civil Engineer Support Agency (AFCESA), the National Institute of Standards and Technology (NIST), the Naval Facilities Engineering Command (NAVFAC), and Rutherford & Chekene Consulting Engineers (R&C), and R&C's subconsultants. Additionally, neither FEMA, R&C nor its subconsultants, AFCESA, FEMA, GSA, NIST, NAVFAC, USBR, or other ICSSC member agencies, nor any of their employees, makes any warranty, expressed or implied, nor assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, product, or process included in this publication. Users of information from this publication assume all liability arising from such use.

## Preface

This seismic rehabilitation techniques document is part of the National Earthquake Hazards Reduction Program (NEHRP) family of publications addressing seismic rehabilitation of existing buildings. It describes common seismic rehabilitation techniques used for buildings represented in the set of standard building types in FEMA seismic publications. This document supersedes *FEMA 172: NEHRP Handbook for Seismic Rehabilitation of Existing Buildings*, which was published in 1992 by the Federal Emergency Management Agency (FEMA). Since then, many rehabilitation techniques have been developed and used for repair and rehabilitation of earthquake damaged and seismically deficient buildings. Extensive research work has also been carried out in support of new rehabilitation techniques in the United States, Japan, New Zealand, and other countries. Available information on rehabilitation techniques and relevant research results for commonly used rehabilitation techniques are incorporated in this document.

The primary purpose of this document is to provide a selected compilation of seismic rehabilitation techniques that are practical and effective. The descriptions of techniques include detailing and constructability tips that might not be otherwise available to engineering offices or individual structural engineers who have limited experience in seismic rehabilitation of existing buildings. A secondary purpose is to provide guidance on which techniques are commonly used to mitigate specific seismic deficiencies in various model building types.

FEMA sincerely thanks all of the federal agencies that contributed funds toward completing this report as well as the members of the Interagency Committee for Seismic Safety in Construction (ICSSC) Subcommittee 1, the Technical Update Team, and all of the federal and private sector partners for their efforts in development, review and completion of this publication.

**ATTACHMENT 4-4: TECHNIQUES FOR THE SEISMIC REHABILITATION OF EXISTING BUILDINGS, CHAPTER 21**

# Chapter 21 - Building Type URM: Unreinforced Masonry Bearing Walls

## 21.1 Description of the Model Building Type

Building Type **URM** consists of unreinforced masonry bearing walls, usually at the perimeter and usually brick masonry. The floors are typically of wood joists and wood sheathing supported on the walls and on interior post and beam construction. This building type is common throughout the United States and was built for a wide variety of uses, from one-story commercial or industrial occupancies to multistory warehouses to mid-rise hotels. It has consistently performed poorly in earthquakes. The most common failure is an outward collapse of the exterior walls caused by loss of lateral support due to separation of the walls from the floor and roof diaphragms. Figure 21.1-1 shows an example of this building type.

Building Type **URMA** is similar to the Building Type **URM**, but the floors and roof are constructed of materials that form a rigid diaphragm, usually concrete slabs or steel joists with flat-arched unreinforced masonry spanning between the joists. Building Type **URMA** is not covered by this document.

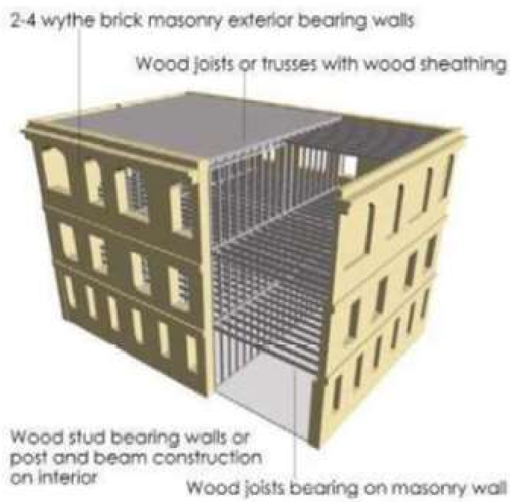



**Figure 21.1-1: Building Type URM: Unreinforced Masonry Bearing Walls**

### *Masonry Wall Materials*

FEMA 306 (FEMA, 1999a) provides an overview of masonry wall material variables. It is paraphrased here. Unreinforced masonry is one of the oldest and most diverse building and roof-to-wall ties and even roof diaphragm sheathing rehabilitation activities are combined with roofing replacement given the cost effectiveness of combining the work.

***Cost and Disruption Considerations***

Adding parapet bracing and roof-to-wall tension anchors provide some of the most effective seismic rehabilitation for reducing life safety risks. As a result, some communities—such as San Francisco—passed parapet safety ordinances requiring mandatory mitigation many years ago. Disruption is typically relatively low since occupants can remain in place. Combining parapet bracing and roof-to-wall ties and even roof diaphragm sheathing rehabilitation activities with roofing replacement can significantly reduce the total cost of the work. Disruption can increase noticeably if the roof has to be removed for installation.

***Proprietary Issues***

There are no proprietary concerns with parapet bracing, other than use of proprietary anchors as part of the assemblage. See Section 21.4.2.

### 21.4.2 Add Wall-to-Diaphragm Ties

***Deficiency Addressed by Rehabilitation Technique***

Inadequate or missing shear and tension connections between the unreinforced masonry bearing wall and the wood floor or roof.

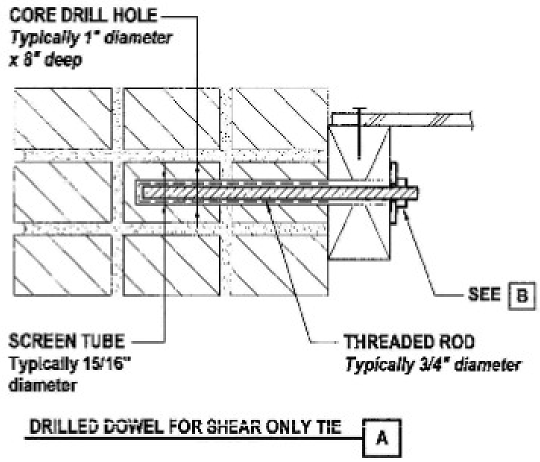
***Description of the Rehabilitation Technique***

The most significant deficiency in URM bearing wall buildings is the lack of an adequate positive (i.e. mechanical) tie between the masonry walls and the floor and roof diaphragms. Ties are usually separated into two categories: tension ties and shear ties. Tension ties transfer out-of-plane inertial loads perpendicular to the face of the masonry back into the diaphragm. Shear ties transfer loads from the diaphragm into the wall where they are resisted by in-plane action of the wall. Tension ties help keep the walls from falling away from the diaphragms; shear ties help keep the diaphragm from sliding along parallel to the wall. Ties are assemblages that consist of both the anchorage to the wall (shown in detail in Figures 21.4.2-1 and 21.4.2-2) and the anchorage back into the diaphragm (shown in the subsequent figures).

***Design Considerations***

*Research basis:* The focus of wall-to-diaphragm testing to date has been on the anchorage to the masonry and has been done primarily by manufacturers. Paquette, Bruneau and Brzev (2003) tested a specimen of a small full-scale one-story building with roof-to-wall ties, but the focus of the work was on wall and diaphragm response.

*Anchor types and capacities:* The 1997 UCBC and 2003 IEBC provide prescriptive values for tension and shear bolts meeting certain requirements. These are for a 2-1/2" diameter hole filled with nonshrink grout approach that is typically no longer used. The ICBO and now ICC evaluation report process has standardized procedures for vendors supplying adhesive ties for use in brick masonry. Three installations are included in most vendors' ICC Evaluation Service reports, and they have standardized installation techniques and capacities. Adapted versions of these installations are shown in Figures 21.4.2-1 and 21.4.2-2. Figure 21.4.2-1A shows a



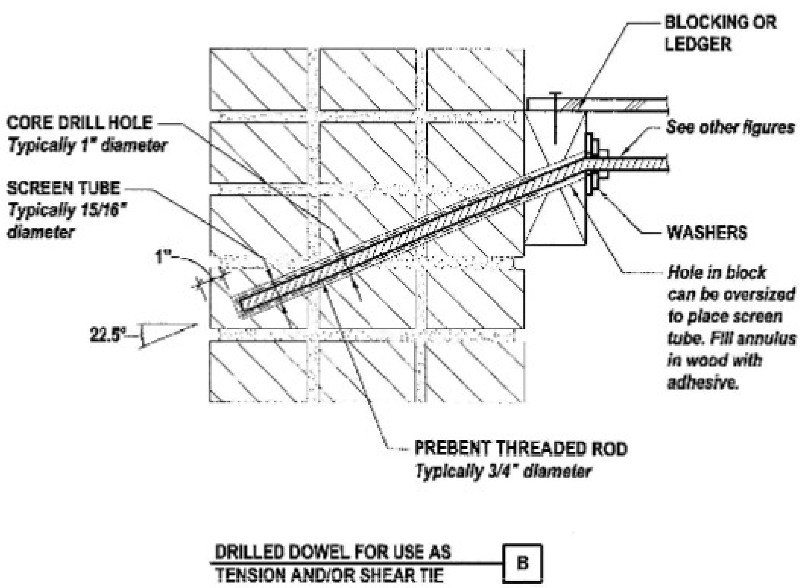




**Figure 21.4.2-1: Drilled Dowels**

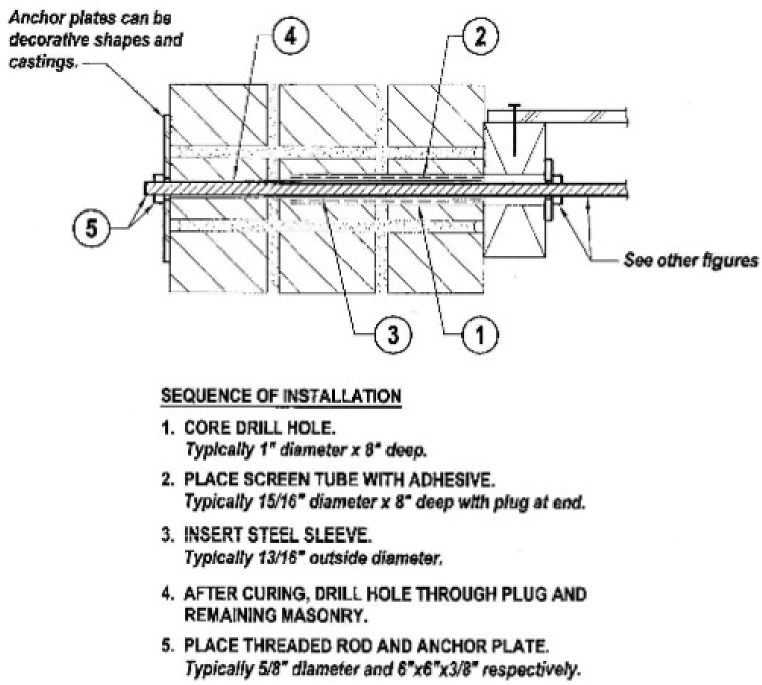



**Figure 21.4.2-2: Through Bolt Anchor**

"combination" drilled dowel that can be used for resisting both tension and shear forces. It is drilled into the wall at a 22.5 degree angle from horizontal at least 13" into the wall. The angle allows the dowel to engage more courses of brick, theoretically improving the reliability. At the allowable stress design (ASD) force level, it is good for 1200 lbs in tension and 1000 lbs in shear. Figure 21.4.2-1B shows a drilled dowel used only for resisting shear forces. It goes in 8" deep into the masonry and is good for 1000 lbs at the ASD level. Figure 21.4.2-2 shows a special through bolt anchor using a steel sleeve in the first 8" that can take tension and shear and has the same values as the combination anchor. These ICC capacities are typically used in design; they come with a number of restrictions and requirements such as quality of masonry. When higher values are needed, proof testing can be undertaken. In the ICC standards for both shear and tension testing (ICC-ES, 2005) of adhesive anchors that manufacturers must use to obtain ICC qualification, allowable stress design capacities are the lower of prescriptive values and the average ultimate test value divided by a safety factors of 5.

It should be appreciated that the prescriptive values in the UCBC, the IEBC, and ICC Evaluation Service reports are based on tests of the drilled dowel itself, not the full elements of the detail.

Capacities for nails, wood structural panels, bolts in wood and straps come from typical code provisions.

***Detailing and Construction Considerations***

There are many issues to consider in detailing for tension and shear ties. These include the following:

*Aesthetics:* Anchors that go all the way through the wall have a visible bearing plate on the exterior face, such as shown in Figure 21.4.2-2. There are simple circular or octagonal plates that can be purchased or fabricated. Some manufacturers make plates with a countersunk hole and use flathead bolt heads to reduce the surface projection. When the exterior face is stucco, a plate with a countersunk hole can be recessed into the stucco or just into the masonry and refinished with stucco so it is hidden. Special cast anchors can be made if there is a desire to match an historic exposed cast iron anchor. When the anchor plate approach cannot be used, drilled dowels are used such as those shown in Figure 21.4.2-1.

*Nonshrink grout vs. chemical adhesive:* Early ties used cementitious nonshrink grout. They required larger diameter holes (such as 2-1/2") to be cored in the masonry to place the grout. A number of vendors have now created special chemical adhesives and tools that have optimized the process. Standard details use ¾" diameter threaded rods in 1" diameter holes, though other sizes can be used, depending on manufacturer requirements. The typical installation approach is to drill the hole; clean it with a brush and compressed air; fill a nylon, carbon, or stainless steel screen tube (which looks like a test tube made out of wire mesh) with adhesive; place the screen tube into the hole; and then push the rod into the screen tube forcing the adhesive out of the tube into the annulus between the tube and the masonry. Figures 21.4.2-1 and 21.4.2-2 show the anchorage using chemical adhesives and screen tubes.

*Chemical adhesive types:* There are many different types of chemical adhesives, though most are epoxy. Epoxy products have the longest track record. Some vendors have begun to produce other types of chemicals. Key issues when considering an adhesive are the length of time the adhesive has been in use, the extent and quality of the testing, the ability to bond to damp or water filled surfaces, setting time, cost, the heat deflection temperature (an ASTM test method for quantifying the loss of strength as ambient temperature rises), and the capacities shown by test results. Most modern adhesives use two-component pre-packaged assemblies, rather than bulk products used in the past. This reduces the risk of improper mixing and not developing the adhesive to its proper strength. When adhesives are curing, the off-gassing can be unpleasant, and proper ventilation procedures are necessary.

*Dowel material type:* Threaded rod is commonly specified as ATSM A36 all-thread rod. It is a relatively ductile material, with a minimum yield strength of 36 ksi and ultimate strength of 60 ksi. When higher strength material is needed (which is rare), ASTM A193, Grade B7 threaded rod can be used with a minimum yield strength of 105 ksi and ultimate strength of 125 ksi. Rebar can be used as well, but this is not typically done in ties that connect to the wood diaphragms since the threaded connection is needed. Threaded rod is sometimes supplied with oil on it. This must be solvent cleaned, so that proper bonding with adhesives can occur.

*Access:* Installation of ties can be done either from below the diaphragm or above. Figure 21.4.2-3 shows installation of floor-to-wall tension ties from below. Figure 21.4.2-4 shows installation occurring from above the floor. Figure 21.4.2-5 shows installation of floor-to-wall shear dowels from above. Similar details are contained in Rutherford & Chekene (1990), SEAOSC (1982) and SEAOSC (1986). The choice of whether to install from above or below depends on whether there are finishes that need to be avoided, whether diaphragm strengthening is being done, and what type of diaphragm strengthening is planned. If there is a special plaster ceiling to be avoided, then access and installation would proceed from above. If there is no plaster ceiling and the floor or roof diaphragm is not being modified or is being enhanced by adding a wood structural panel overlay from above, then access and installation for wall-diaphragm ties would be from below. Angled dowels (see section below) installed from below can be angled upwards rather than the typical downward angle, provided non-sag adhesives are used.

*Joist direction:* Framing in most *buildings* is orthogonal so that joists or rafters are either perpendicular or parallel to the in-plane direction of the wall. Installations where the joists are perpendicular to the wall are easier to make; installations where the joists are parallel involve blocking and more complicated details. Figures 21.4.2-3 to 21.4.2-5 show variations for joist orientation.

*Special issues at the top of the wall:* In most **URM** buildings, the wall continues up past the roof forming a parapet that provides fire protection and serves as a guardrail during roof maintenance, as described in Section 24.4.1. In some buildings, though, the roof continues over the top of the wall. In these situations, the roof might be relatively flat or sloped. As a result, special issues arise. First, there is reduced overburden pressure at the top of the wall, reducing the reliability of drilled dowels. Second, eccentricities become more significant, such as the vertical eccentricity between the roof diaphragm and the top of the masonry. Making reliable connections between walls in these situations can be particularly challenging and is usually dependent on the specific geometry and characteristics of the existing details. A common strategy is to employ a concrete bond beam at the top of the wall. This ties the wall together, serves as a collector and chord, increases redundancy and often simplifies details. Figure 21.4.2-6 shows a bond beam placed on top of an existing wall under the roof framing. This is possible when the wall is wide, and there is sufficient distance between the masonry and rafter. Figure 21.4.2-7 shows an alternative when there is insufficient clearance between the rafter and top of wall that involves removing the top two courses of masonry to gain room for the bond beam.

*Eccentricity:* It is desirable to minimize the eccentricities in a connection. Figure 21.4.2-8 illustrates the issue and some alternate approaches with floor-to-wall tension ties. Figure 21.4.2-8A shows a common tension tie detail in plan view where a tie-down anchor is connected to the side of an existing joist. The plan offset between the drilled dowel at the center of the tie-down where load is applied and the center of the joist where it is resisted times the force is a moment that must be resisted by the joist in weak way bending. This stress can be quite significant. Figure 21.4.2-8B shows an alternative where two tie-downs are used to make a connection that is

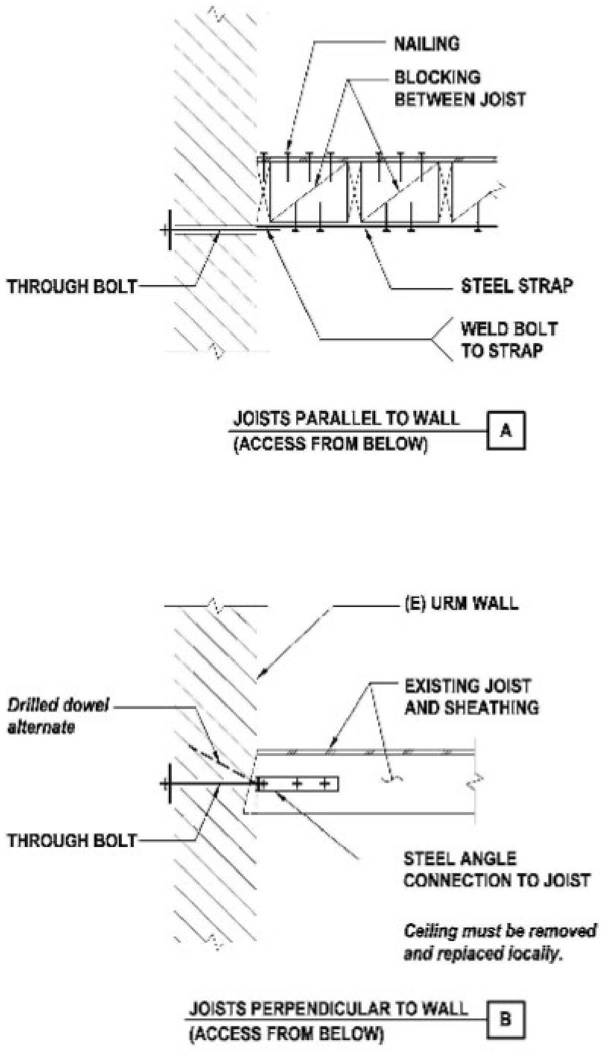



**Figure 21.4.2-3: Tension Anchors Installed from Below the Floor**

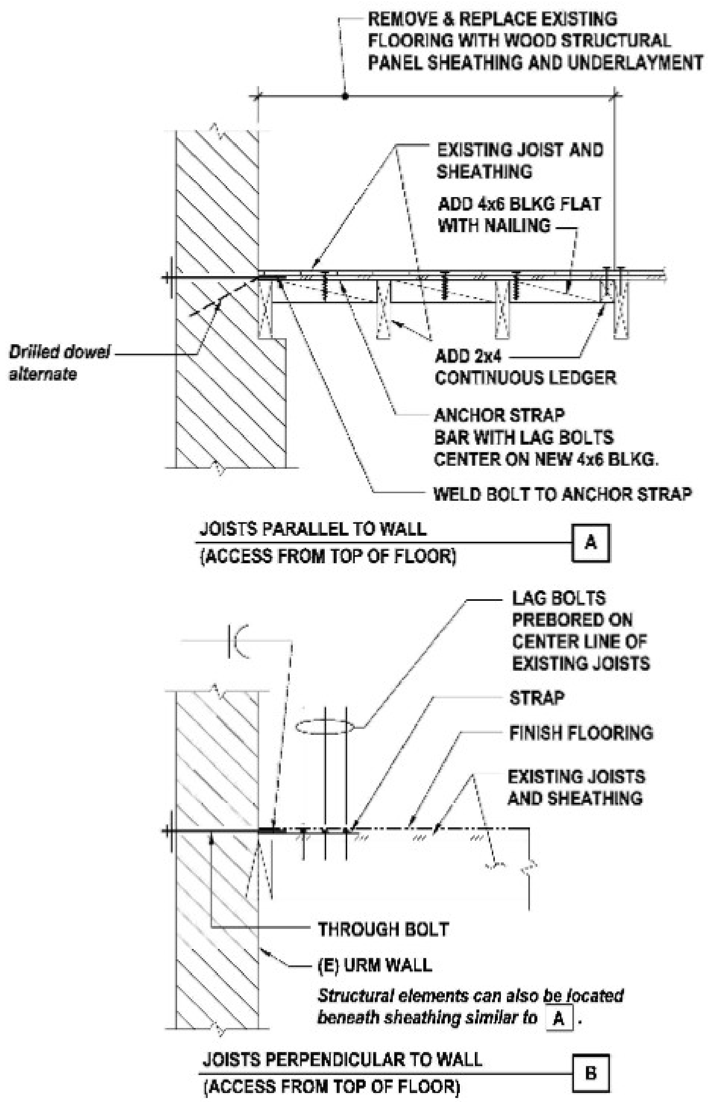



**Figure 21.4.2-4: Tension Anchors Installed from Above the Floor**

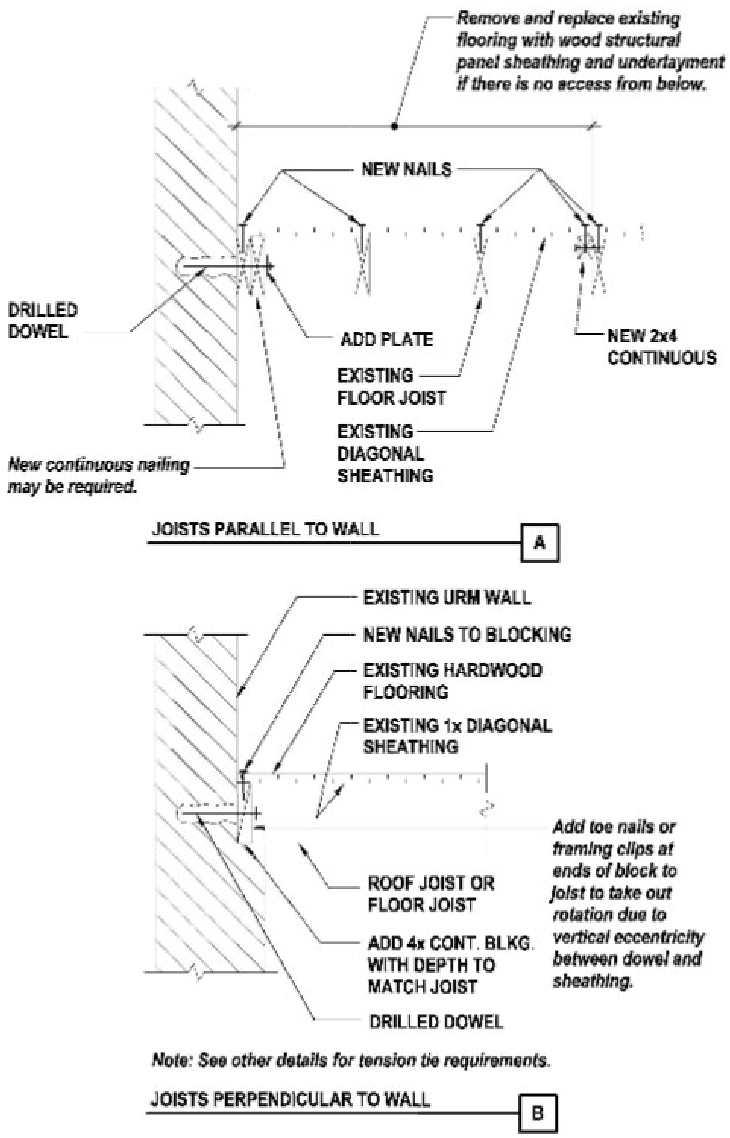



**Figure 21.4.2-5: Floor-to-Wall Shear Anchors**

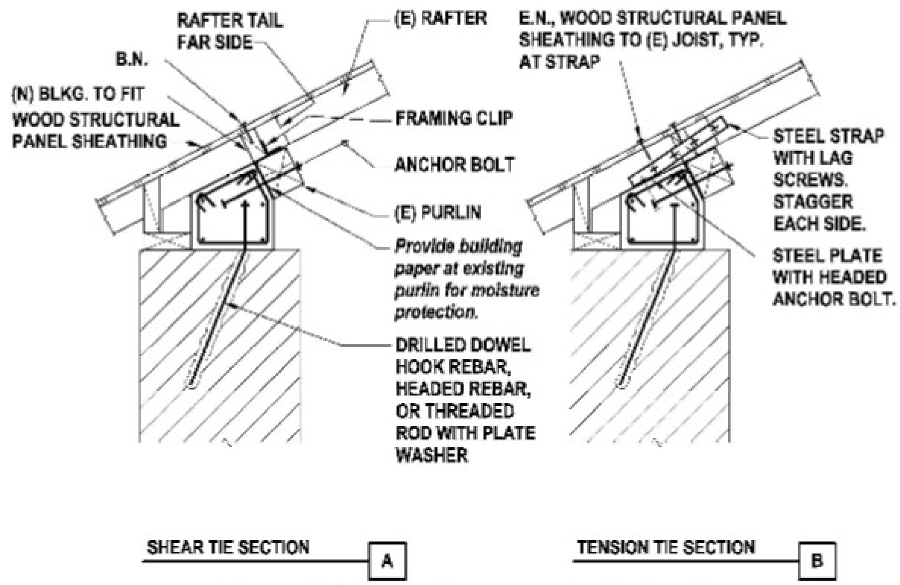



**Figure 21.4.2-6: Bond Beam at a Sloping Roof**

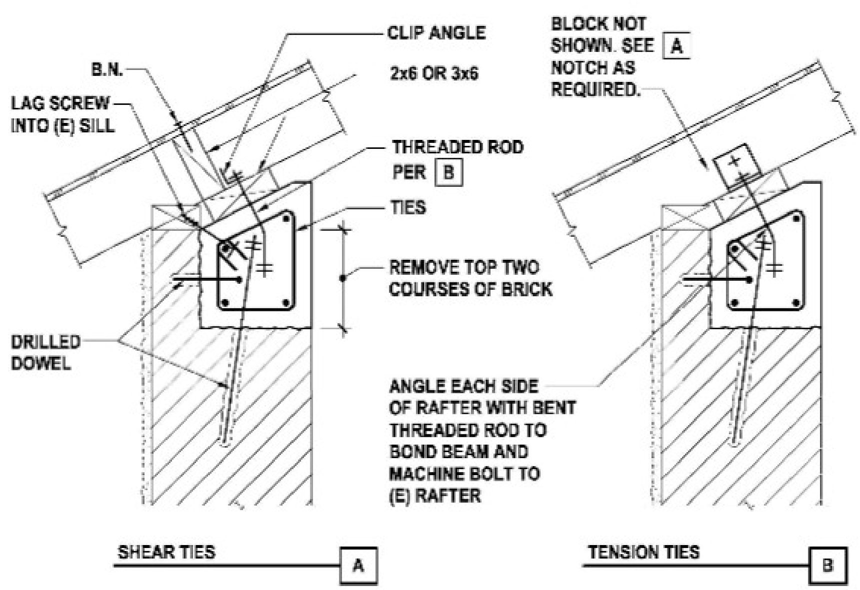



**Figure 21.4.2-7: Bond Beam at a Sloping Roof with Limited Clearance**

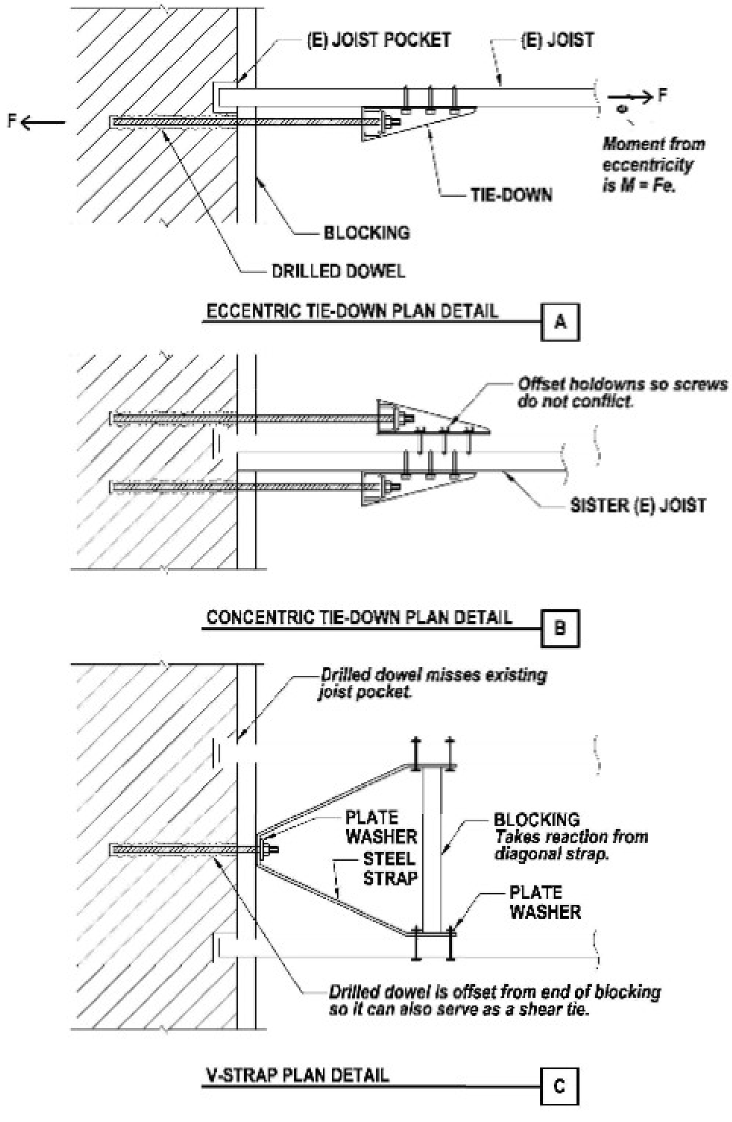



**Figure 21.4.2-8: Tension Tie Connection Issues**

more concentric. This detail, however, puts a large number of screws into the existing joist, so a sistered joist is shown. Adding the sister also permits the nailing into the diaphragm to be into each joist, reducing the nailing demand on the joists. Bolted tie-downs, instead of tie-downs with screws, can be used with through bolts placed in double shear. Traditional bolted tie-downs have greater slip than the more recent tie-downs using screws. There are proprietary connectors using tubes as tie-downs on each side without oversize holes that bolt eliminate eccentricity and reduce bolt slip. Both Figure 21.4.2-8A and 21.4.2-8B have dowels adjacent to the joist. This means the dowel will enter the wall next to or in the weakened area of joist pocket and at the end of new blocking used for shear transfer, where there is insufficient end distance to use the dowel as a shear tie. Figure 21.4.2-8C shows a V-strap detail where the drilled dowel is placed between joists, away from the joist pocket and with plenty of end distance. When the strap is in tension, forces perpendicular to the joists are produced that are resisted by the added blocking and plate washers.

*Truss anchorage:* In some **URM** buildings, there will be large gravity elements that bear on the wall, such as girders or trusses. These also become concentrated points of stiffness in the diaphragm. Since the relative rigidity of the elements cannot be easily quantified, it is usually prudent to use an enveloping or "belt and suspenders" approach of assigning demand, so that typical anchors between trusses take the uniform load and the ties connecting the wall and trusses take additional load.

*New ties vs. reuse of existing ties:* In many older **URM** buildings, there are existing ties called government or "dog" anchors. These anchors typically only occur in the direction where the joists are perpendicular to the face of the wall, and they may not be at sufficient spacing. The 1997 UCBC and 2003 IEBC permit use of these anchors as wall-to-diaphragm tension anchors if tested in accordance with certain standards and capacities are sufficient.

*Dowel spacing and edge distance:* The 1997 UCBC and 2003 IEBC have maximum spacing requirements on shear and tension dowels. When walls become thick, the out-of-plane demands and the relatively low ICC Evaluation Service report capacity values can lead to fairly tight spacing of dowels. The UCBC and IEBC do not have minimum spacing requirements. From a practical point of view, dowels should not be placed closer than 12" o.c. Some ICC reports provide minimum spacing limits as well, like those commonly employed for drilled dowels in concrete. For one vendor, these spacing limits are 16" o.c. in the horizontal and vertical direction, and there is 16"minimum for edge distance as well.

*Corrosion considerations:* Drilled dowels are typically installed from the interior. The masonry cover and epoxy serve as corrosion protection, so mild steel anchors are typically considered sufficient. For increased corrosion protection, stainless steel dowels and screen tubes can be used. When through bolted connections are installed, there is a more direct path for moisture intrusion. The anchor plate can be painted with exterior grade paint, galvanized or be made from stainless steel, and the through bolt can be made from stainless steel as well.

*Screen tubes:* The purpose of the screen tube is to prevent loss of epoxy into cracks or unfilled collar joint voids within the wall. Screen tubes vary somewhat from vendor to vendor and should be considered part of the manufacturer's assembly. Nylon screen tubes have begun to be supplied by many vendors as they are more economical than stainless steel and more corrosion resistant than carbon steel. They do have a much larger coefficient of thermal expansion than both steel screen tubes and masonry.

*Hollow masonry:* Anchorage of hollow clay tile, ungrouted concrete masonry units and other hollow masonry systems to diaphragms is particularly challenging. When forces are large, grouting in the region of the anchor is usually required. When forces are small, use of screen tubes may be acceptable. The screen tube is filled with adhesive, inserted into the wall and as the dowel is pushed into it, the adhesive seeps through the screen tube forming a key behind the face shell of the masonry. Capacities are small and the connection is nonductile. This type of connection may be viable for out-of-plane wall strengthening (see Section 21.4.3) where the demands are lower, but it is not recommended for wall-to-diaphragm connections. Figure 21.4.2-9 shows a method of connecting a floor to an ungrouted CMU wall. Even in ungrouted CMU, a grouted bond beam is usually found beneath the floor, and it helps provide bearing support for the floor joists. Figure 21.4.2-9 involves locally grouting the courses at and just above the floor to install a new anchor. Figure 21.4.2-10 shows an alternative that avoids working from above and uses the existing bond beam. Sistering and a nailer help get the new anchor to the proper elevation. If a grouted bond beam is not present, it may be necessary to create one to make the proper anchorage, similar to the top courses in Figure 21.4.2-9.

*Drilling:* Holes need to be drilled with a rotary drill or a rotohammer drill with the percussion setting turned off to limit vibration into the wall. This can slow drilling significantly. In some cases, coring with a diamond tipped blade is more efficient. This may be the only way some hard masonry, like granite, can be drilled. Sometimes water is used to cool the bit, and the slurry produced by the water, mortar and masonry can stain the face of the wall.

***Cost/Disruption***

Considerations for cost depend on the number, type and depth of dowels; the difficulty of access; and the extent of finishes that are impacted. Through bolts are usually less expensive than adhesive anchors.

Drilling is loud and can be disruptive to occupants. Typically, either the floor or ceiling has to be removed to install the dowels. Thus, it is usually not practical to install dowels in occupied rooms, though the work can be phased by building area so disruption is minimized.

***Proprietary Issues***

Values for anchor capacity come from individual vendors, but there are no known concerns with use of a properly procured product.

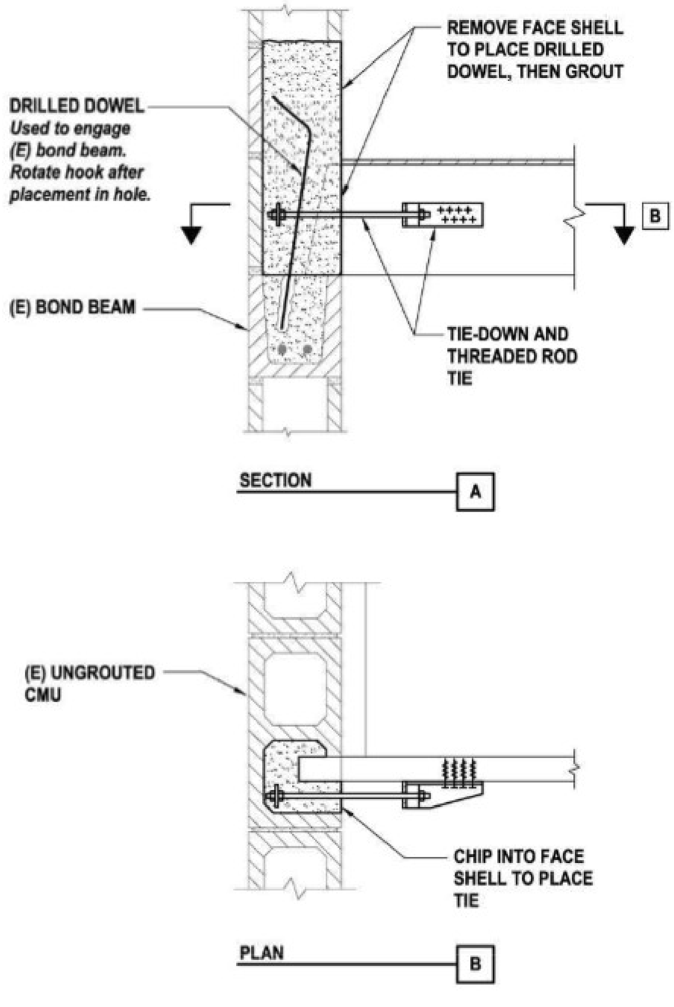



**Figure 21.4.2-9: Wall-to-Floor Tension Tie in Hollow Masonry**

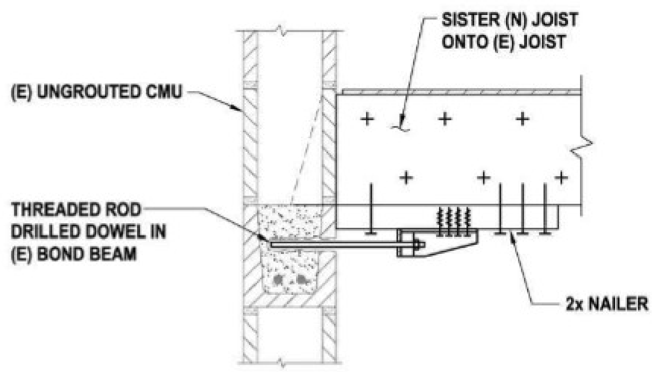



**Figure 21.4.2-10: Wall-to-Floor Tension Tie in Hollow Masonry Alternate**

### 21.4.3 Add Out-of-Plane Bracing for URM Walls

***Deficiency Addressed by Rehabilitation Technique***

Inadequate out-of-plane bending resistance of an unreinforced masonry wall.

***Description of the Rehabilitation Technique***

Two types of bracing can be used: diagonal braces that reduce the effective height of the masonry wall (Figure 21.4.3-1A) and vertical braces or strongbacks that span the full height of the inside face of the wall (Figure 21.4.3-1B). Vertical braces can be surface mounted or, when aesthetic considerations are paramount, recessed into the wall; see Figure 21.4.3-2.

***Design Considerations***

*Research basis:* The most comprehensive set of testing done to date on out-of-plane response of URM walls was part of the ABK research program in the 1980s, and it is documented in ABK (1981c). Full-scale, dynamic testing of 20 wall specimens was conducted. Specimens were 6' wide, 10' to 16' tall, and had height-to-thickness (*h/t*) ratios that varied from 14 to 25. Superimposed axial loads were varied; and materials included brick, grouted CMU, and ungrouted CMU.

*H/t limits:* It is tall, narrow walls that have been found to be susceptible to out-of-plane wall demands. The 1997 UCBC and 2003 IEBC provide maximum *h/t* requirements. Walls with larger *h/t* ratios must be braced.

*Spacing:* For strongbacks, such as shown in Figures 21.4.3-1B and 21.4.3-2A, the maximum spacing requirements are set by the 1997 UCBC or 2003 IEBC at the minimum of 10 feet or half the unsupported height of the wall. For diagonal braces, the maximum spacing is set at 6 feet.

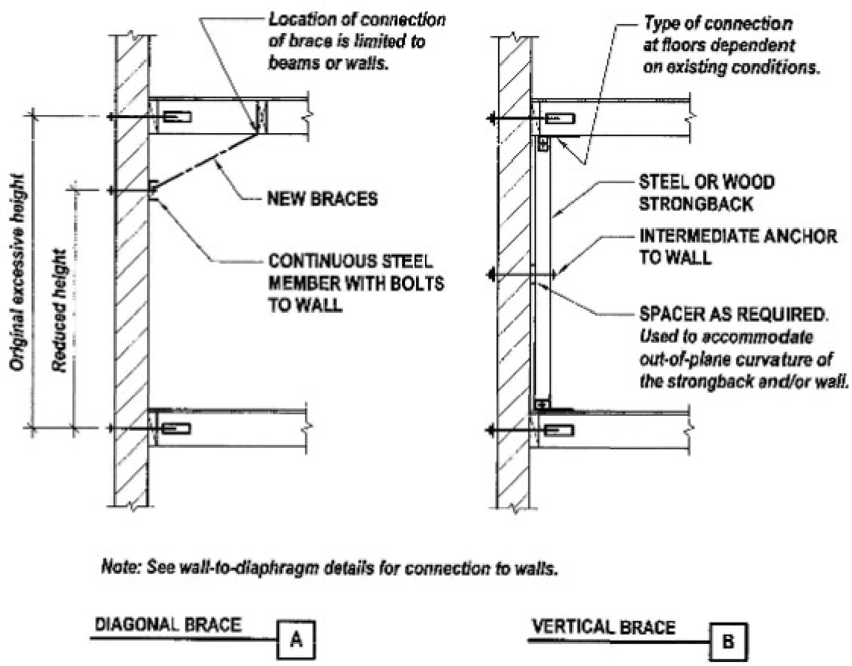



**Figure 21.4.3-1: Exposed Out-of-Plane Wall Bracing**

*Stiffness:* For strongbacks, such as shown in Figures 21.4.3-1B and 21.4.3-2A, the 1997 UCBC limits deflection of the wall at ASD demands to one tenth of the wall thickness. This is not a particularly stringent requirement. Say that the first story of a multistory building in Seismic Zone 4 is 13" thick and 18' tall and its resulting *h/t* ratio of 16.7 exceeds the *h/t* limit of 16 in the UCBC. Bracing would be need to be stiff enough to keep deflections down to 10% of 13" or 1.3". This is L/166, which is comparatively low to most masonry design requirements, which are typically L/360 or higher, up to even L/600. Kariotis (1982) notes that the goal of a flexible vertical brace is to keep the brace elastic and provide a predictable restoring force during cracked excursions of the masonry wall. For diagonal braces, the UCBC encourages detailing to minimize vertical deflections.

*Diagonal braces loading vs. bracing the wall:* If the roof deflects downward on a diagonal brace, a horizontal reaction is imparted to the wall. One concern with diagonal braces is that vertical vibration of the roof in an earthquake can contribute to the out-of-plane inertial forces on the wall. This concern, combined with the difficulty of making the roof stiff enough for against vertical deflections, makes vertical bracing a preferred engineering choice over diagonal bracing.

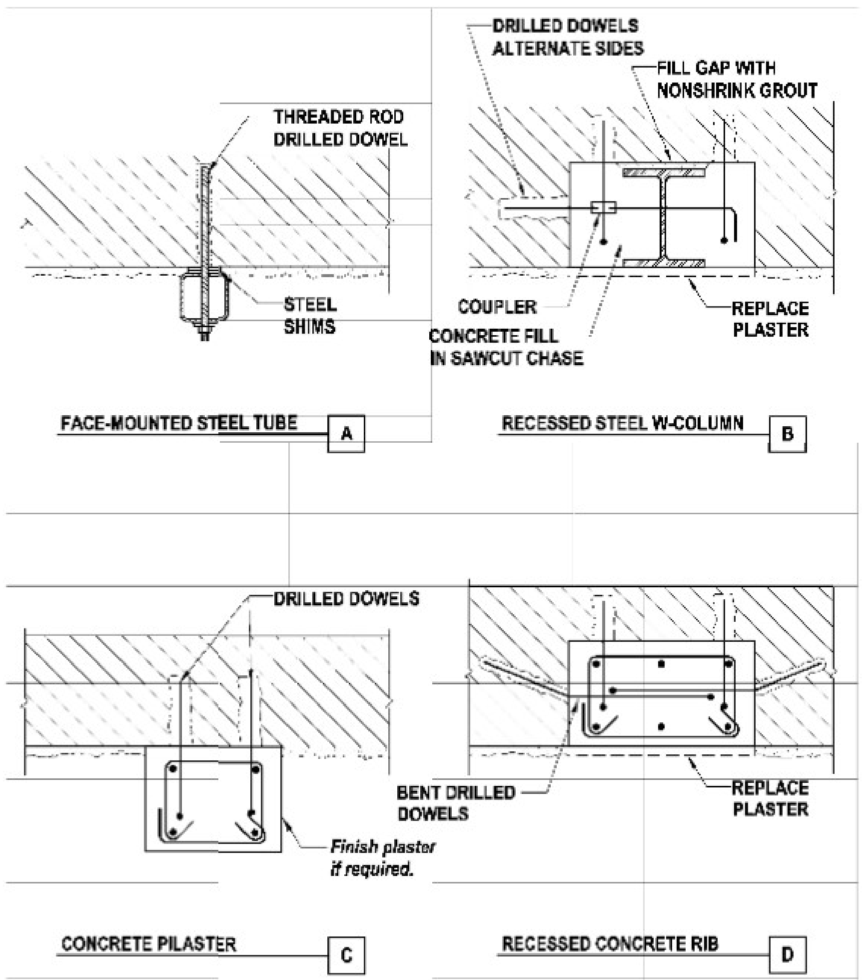



**Figure 21.4.3-2: Vertical Bracing Alternatives**

*Recessed steel and concrete and surface-mounted concrete:* Provisions in the 1997 UCBC and 2003 IEBC do not explicitly consider the approaches shown in Figures 21.4.3-2B, 21.4.3-2C and 21.4.3-2D. These approaches are unusual, but they can be used when a more sensitive aesthetic approach or higher loads are needed.

***Detailing and Construction Considerations***

*Materials:* Braces are typically done with steel as shown in Figures 21.4.3-1 and 21.4.3-2A, but strongbacks can also be done with wood posts or with concrete pilasters (Figure 21.4.3-2C).

*Aesthetics:* Figure 21.4.3-1 shows exposed braces. This is the least expensive approach and is appropriate for certain occupancies. When there is architectural desire to hide the steel, the bracing can be furred at added cost and impact on the usable space. To minimize the impact on the space, the vertical brace can recessed into a cavity cut in the wall with either a steel or a concrete member. See Figure 21.4.3-2. Recessing the steel or concrete requires significantly more work and raises the potential for cracking to propagate from the inside of the recess to the masonry face.

*Strongback anchor spacing:* Figure 21.4.3-1B shows only a central anchor at midheight of the wall. Often demand/capacity ratios for anchorage to the wall with through bolts or drilled dowels (see Section 21.4.2) will dictate a tighter spacing of anchors.

*Floor/roof framing capacity:* Figure 21.4.3-1 shows anchorage to joists oriented perpendicular to the wall. When joists are parallel to the wall, the horizontal anchorage force must be developed out into the diaphragm. In Figure 21.4.3-1A, the existing roof beams may need to be strengthened to provide adequate strength to resist downward loading.

*Hollow masonry:* Figures 21.4.3-1 and 21.4.3-2 apply to solid masonry. When the existing masonry is hollow, alternative connection methods are needed. Figure 21.4.3-3 shows use of vertical concrete ribs. A chase is created by removing the face shell on one side of the wall. Reinforcing steel is added and then grout or concrete fill. There is typically insufficient space for ties. This approach is messy and noisy. Figure 21.4.3-4 shows an alternative where steel strongbacks are bolted to the wall with either drilled dowels or through bolts. The screen tube anchor of Figure 21.4.3-4A relies on mechanical keying action from the spreading adhesive to engage the face shell. The capacity is limited to the face shell of the masonry and can be quite low, in the low hundreds of pounds at allowable stress design levels. It is also nonductile as the failure mechanism is spalling of the face shell. The through bolt in Figure 21.4.3-4B provides increased capacity and locally grouting in the anchor provides additional capacity.

***Cost/Disruption***

Diagonal bracing is usually less expensive, but is considered less reliable than vertical bracing. Furring can be used to cover the braces at added cost. Exposed braces are typically less expensive than more architecturally sensitive alternatives like recessed vertical braces or reinforced cores (See Section 21.4.4). Installation of bracing is fairly disruptive since it must occur around the entire perimeter; and it involves drilled dowels, and accessing and connecting to horizontal diaphragms.

***Proprietary Issues***

There are no known proprietary concerns with bracing of URM walls.

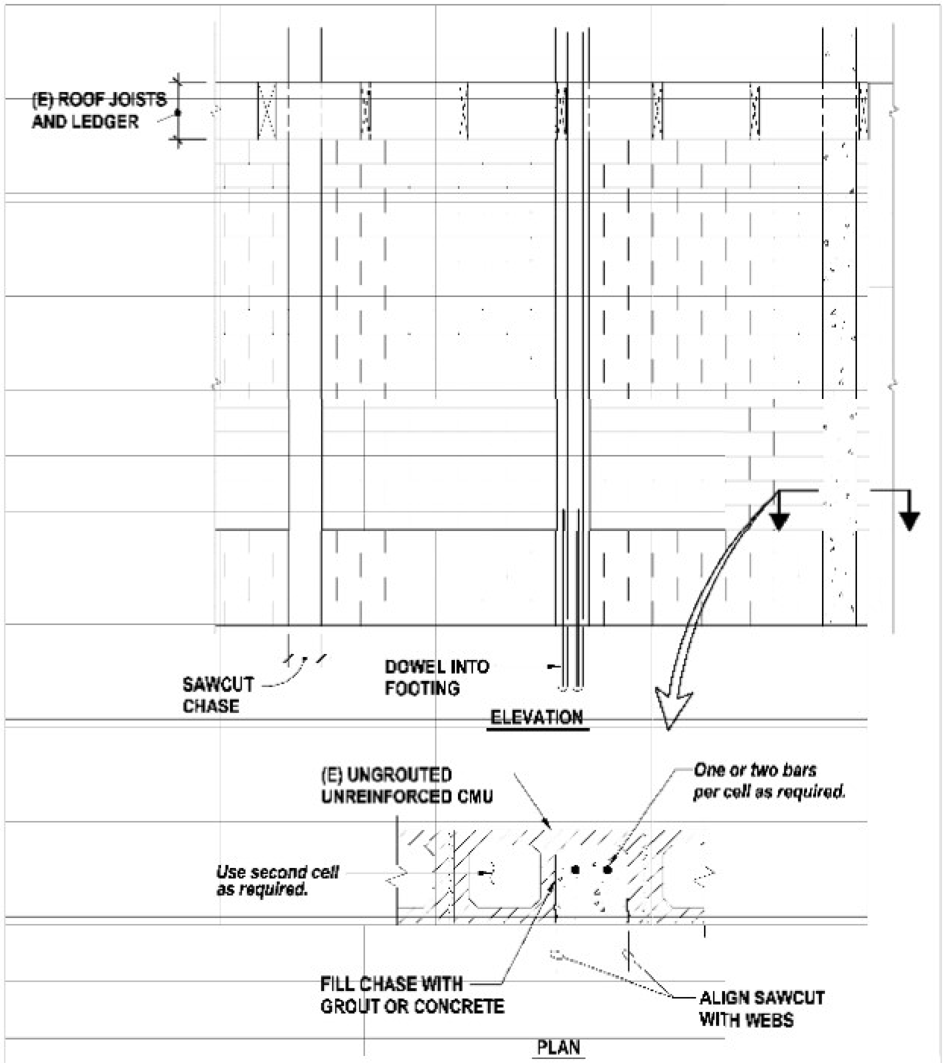



**Figure 21.4.3-3: Concrete Ribs in Hollow Masonry**

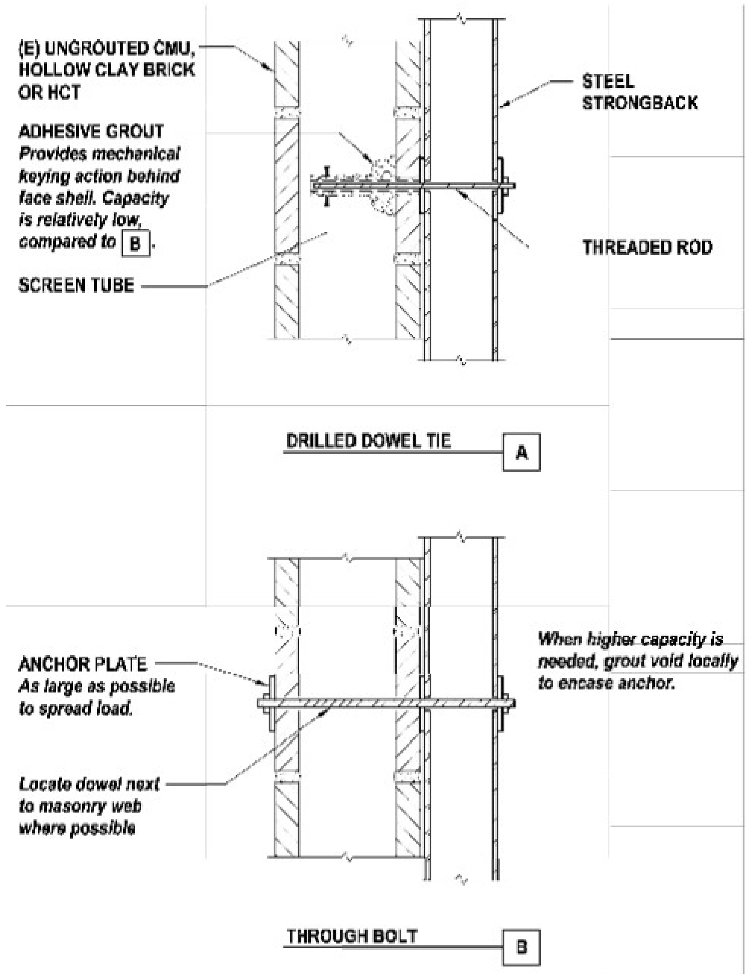



**Figure 21.4.3-4: Connection of Strongback to Hollow Masonry**



...

*In-plane shear transfer:* In Figure 21.4.8-1, shear transfer from the diaphragm to the wall goes from the diaphragm boundary nailing to the ledger and through the threaded rod into the wall. A tight fit on the rod and ledger is needed. The ledger should be dry dimensional lumber or glulam material to minimize vertical shrinkage of the ledger. When the wall is not as long as the diaphragm (a very common occurrence), a collector attachment into the wall will be needed. Figure 21.4.8-1A shows a steel angle with headed studs cast into the wall and diaphragm-to-collector connections using lag screws. The steel could go above or below the floor. When loads are relatively low, wood members such as the ledger can be used as the collector.

*Out-of-plane tension transfer:* In Figure 21.4.8-1, tension transfer of wall loads goes into the tie-down anchor, into the blocking, through straps in the blocking to additional blocks as required and eventually back into the diaphragm. Alternatively, blocking for a bay or two can be placed on both sides and out-of-plane resistance accomplished by compression bearing on the diaphragm joists.

*Joist direction:* When the wall can be fit in between existing joists, the amount of labor is reduced. When joists are perpendicular to the wall, the joists are typically headed off on each side of the wall to allow the wall to pass through. This requires temporary shoring of the floor around the wall. At the top of the wall, the wall can stop just under the joists and be blocked up to the diaphragm for shear transfer.

*Shotcrete vs. cast-in-place concrete:* See Section 21.4.5 for discussion of shotcrete vs. cast-in-place concrete issues.

***Cost/Disruption***

See Section 21.4.5 for discussion of cost and disruption issues.

***Proprietary Issues***

There are no proprietary concerns with connecting a concrete or masonry wall to a wood diaphragm.

### 21.4.9 Add Steel Moment Frame (Connected to a Wood Diaphragm)

***Deficiency Addressed by Rehabilitation Technique***

A new moment frame provides additional global strength, reduces demands on existing masonry walls and can reduce demands on diaphragms by cutting tributary spans.

***Description of the Rehabilitation Technique***

When a moment frame is added into a **URM** building, it typically goes either just behind a highly punctured street front façade or at an interior location within the diaphragm. Figure 21.4.9-1 shows the perimeter condition; Figure 21.4.9-2 shows interior conditions. A moment frame retrofit at a **W1A** building with a soft story is discussed in Chapter 6.

***Design Considerations***

*Research basis:* New steel moment frame issues are covered by FEMA 350 (FEMA, 2000). The CUREE woodframe project report on tuckunder building testing (Mosalam, et al., 2002) documents quasistatic component testing of moment frame to wood diaphragm connections and full-scale testing of a three-story tuckunder apartment building rehabilitated with a ground story moment frame on the open front side.

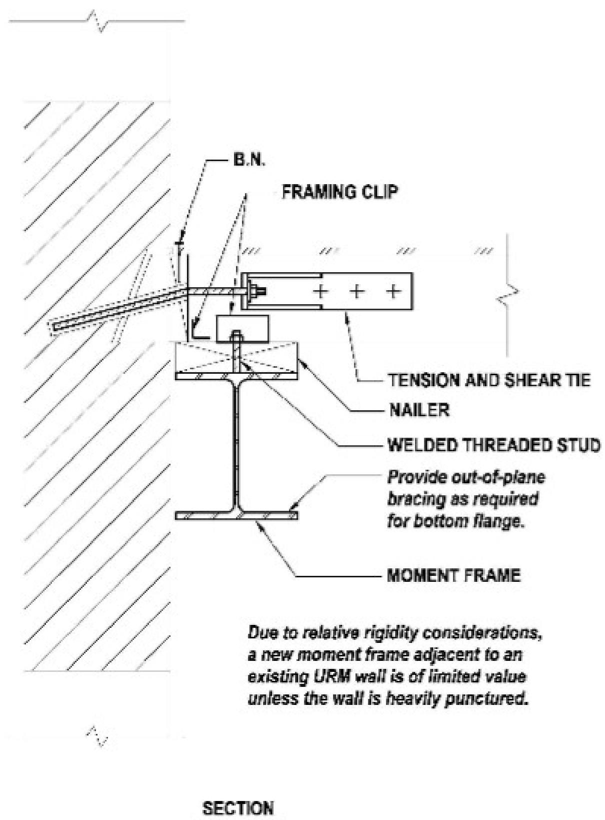



**Figure 21.4.9-1: New Perimeter Steel Moment Frame to an Existing Wood Floor**

*Stiffness considerations:* At either the perimeter or interior condition, reasonable stiffness of the frame is desirable. At the perimeter, minimizing the amount of drift and resulting masonry façade cracking is desirable. At the interior, if the moment frame does not have sufficient stiffness, the diaphragm will span between the end walls with the moment frame taking out relatively small loads due to its flexibility.

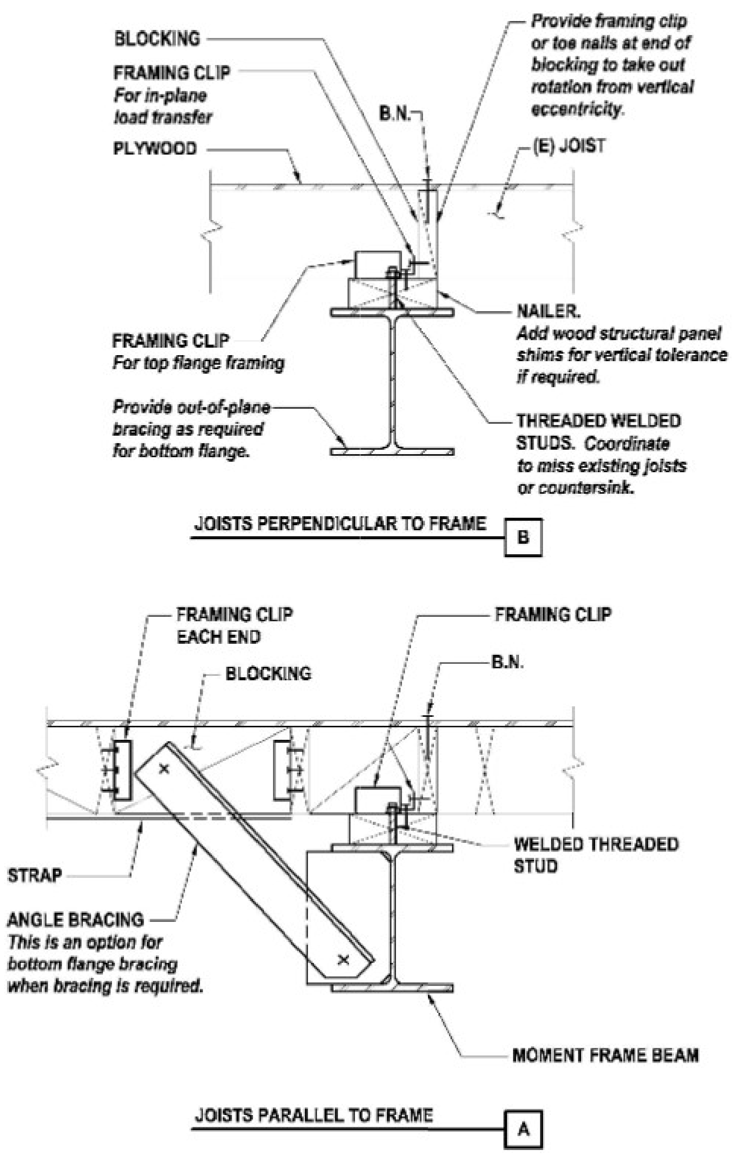



**Figure 21.4.9-2: New Interior Steel Moment Frame to an Existing Wood Floor**

*Design forces:* The new moment frame design can be governed by either stiffness or strength. Strength demands can either be minimum design loads or in some cases the moment frame can be designed to be stronger than the diaphragm so inelastic action happens in the diaphragm. For connection design of the frame to the diaphragm, it is particularly desirable to make sure the connections are stronger than the weaker of the diaphragm or the moment frame.

*Pinned base:* To minimize foundation demand requirements, new moment frames in retrofits are often designed with pinned bases.

***Detailing and Construction Considerations***

Detailing and construction considerations for connecting a new moment frame to an existing wood diaphragm include the following.

*Welding vs. bolting:* Welding adjacent to wood framing poses a very real fire hazard. Specifications and common sense usually dictate various fire watch provisions in these situations. Cases of hot welding slag lost from view and later reigniting wood material after the welding for the day was finished have been observed and are particularly troublesome. Where possible, detailing with shop welded connections, and then field bolting, is desirable. See Chapter 8 for additional comments on welding.

*Connecting directly to the masonry:* In Figure 21.4.9-1, the moment frame is connected to both the masonry façade and the diaphragm to take out load from the punctured wall into the frame and from the diaphragm into the frame. In alternative details, the load can be taken from the wall into the diaphragm and then through the diaphragm to the frame.

***Cost/Disruption***

Installation of a new moment frame can be fairly disruptive, though it is usually less disruptive than a new wall. The frame is chosen when existing window or door openings need to be preserved, but head height and visual issues must be considered. Adding new structural steel members can be comparatively expensive, but if the choice is to provide a wood structural panel overlay on a floor or add a new moment frame, the new moment frame can often be less expensive.

***Proprietary Issues***

There are no proprietary concerns with connecting a steel moment frame to a wood diaphragm. Certain moment frame beam-to-column connections may have proprietary considerations. See Chapter 8.

### 21.4.10 Add or Enhance Crosswalls

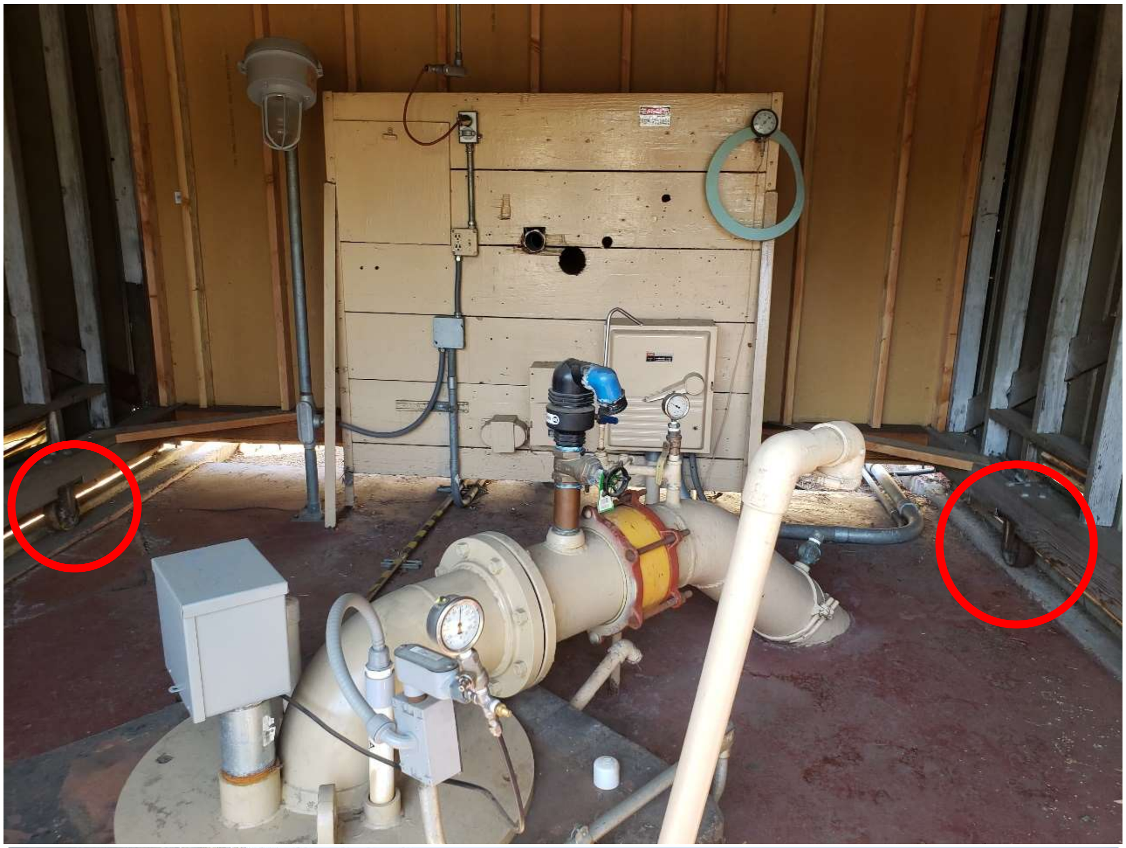
***Deficiency Addressed by Rehabilitation Technique***

Inadequate diaphragm strength and/or excessive diaphragm displacement.

***Description of the Rehabilitation Technique***

The ABK research program (ABK, 1984) showed that partition walls, called crosswalls, serve as energy-absorbing, displacement-limiting damping elements during seismic loading. The 2003

## ATTACHMENT 4-5: CAL ADVOCATES INDIAN HILL NORTH SITE PHOTOGRAPHS



**ATTACHMENT 6-1: GSWC RESPONSE TO PUBLIC ADVOCATES DATA REQUEST AA9-004**

Golden State Water Company
A Subsidiary of American States Water Company

August 27, 2020

Anthony Andrade, Public Advocates Office
**CALIFORNIA PUBLIC UTILITIES COMMISSION**
505 Van Ness Avenue
San Francisco, CA 94102

Subject: Data Request AA9-004 (A.20-07-012) Region 3 Wells - Response
Due Date: August 27, 2020

Dear Anthony Andrade,

In response to the above referenced data request number, we are pleased to submit the following responses:

**Question 1:**
In "Hanford and Insco Operating District Capital Testimony," page 208, lines 17-19, GSWC states that Metropolitan Water District (MWD) shutdowns are expected to occur more frequently due to an increase in MWD maintenance projects.

a. Please provide the communication or document that states that MWD shutdowns are expected to occur more frequently. If no such document exists, please provide GSWC's basis for this expectation.

b. Please provide the supply contract/MOU agreement between MWD and GSWC's Placentia-Yorba Linda, San Dimas, and South San Gabriel systems.

**Response 1:**

a. Attached is a 6/9/2020 MWD Board report, pdf file "Q.1.a 06092020 MWD BOD 8-1 PCCP Project" that describes MWD's emergency repairs to 2,900 lineal feet of the approximately 158,400 lineal feet (30 miles) of pre-stressed concrete cylinder pipe (PCCP) that was constructed as part of MWD's Second Lower Feeder. As noted in this report, with 90,816 lineal feet (17.2 miles) of PCCP remaining to be remediated (see page 2), GSWC anticipates MWD shutdowns to occur more, as the report also states. The report also states, "PCCP lines have a reduced service life and elevated risk of failure as compared with other types of pipe. PCCP failures can be catastrophic and can occur without forewarning, compromising system reliability, and resulting in significant costs due to interruption of service, unplanned major repairs, and potential third-party damages." (page 1).

b. Attached is a purchased water agreement between the Municipal Water District of Orange County Water District (MWDOC), formerly known as Orange County Municipal Water District and GSWC, formerly known as Southern California Water Company, pdf file "Q.7a R3 Agreement MWDOC Pur Wtr Agrmnt". Please note that MWDOC supplies purchased water to GSWC's Placentia-Yorba Linda system.

   GSWC does not have a similar contract with Upper District, which serves GSWC's South San Gabriel system and Three Valleys Municipal Water District, which serves its San Dimas system.

**Question 2:**
The existing Bradford Well No. 3 serves the Placentia-Yorba Linda system's South Zone. In Attachment C-32 Placentia-Yorba Linda Master Plan, Table 5-16, GSWC shows that the South Zone has no direct connection to other systems. In Table 5-14, GSWC shows that the South Zone receives water transfers from the system's North Zone during the peak hour demand scenario. Also in Table 5-14, however, GSWC shows that the South Zone's demand on the North Zone during outages is "0."

How would the replacement for Bradford Well No. 3 be useful during an outage caused by a MWD shutdown?

**Response 2:**
As noted in Attachment C-32 Placentia-Yorba Linda Master Plan, Figure 2-2, the Placentia – Yorba Linda System Schematic shows that the South Zone can supply the North Zone via the Chapman Booster Station. As seen in Attachment C-32 Placentia-Yorba Linda Master Plan, Table 5-16, the ADD, MDD, and PHD demands are 920 gpm, 1,559 gpm, 2,339 gpm respectively. The total supply in the South Zone is 2,050 gpm which is a combination of the 3 wells on the South Zone (La Jolla Well 2, Bradford Well 3, and Bradford Well 4). Under ADD and MDD scenarios, the South Zone has excess water supply that can be boosted into the North Zone via the Chapman Booster Station. The replacement of Bradford Well 3 will introduce a reliable groundwater source that can be used to mitigate the reliance of purchased water in the Placentia-Yorba Linda system.

**Question 3:**
In Attachments P05, SD03, SD04, and SGV03, GSWC provides cost/benefit analyses for replacing wells. The following table summarizes GSWC's estimates for the well replacements' annual water production.

| Requested Well: | La Jolla No. ? | Baseline No. ? | Columbia No. ? | Saxon No. 5 |
|---|---|---|---|---|
| Replaces Well: | Bradford No. 3 | Baseline No. 3 | Columbia No. 4 | Saxon No. 3 |
| Annual Water Production (AFY) | 484 | 605 | 363 | 847 |
| Design Capacity (gpm) | | | | |

a. Please complete the table above by providing the design capacity of each requested well.
b. Please explain how GSWC determined the above annual water production estimates.
c. In Attachments P05 and SD03, GSWC provides a cost/benefit analysis for a "La Jolla Well No. 2" and a "Baseline Well No. 5" respectively. GSWC, however, uses the "La Jolla Well No. 2" and "Baseline Well No. 5" names for previously authorized wells.
   Please explain if the cost/benefit analyses in Attachments P05 and SD03 are for the wells requested in the current GRC.
d. In Attachment SD04, GSWC provides a cost/benefit analysis for a "Columbia Well No. 6." In Attachment C-33 San Dimas Master Plan, page 2-4, GSWC identifies "Columbia Well 6" as a non-operational well. Please explain if the cost/benefit analyses in Attachment SD04 is for the Columbia well requested in the current GRC.

**Response 3:**

a. Please refer to the table below

| Requested Well: | La Jolla No. ? | Baseline No. ? | Columbia No. ? | Saxon No. 5 |
|---|---|---|---|---|
| **Replaces Well:** | **Bradford No. 3** | **Baseline No. 3** | **Columbia No. 4** | **Saxon No. 3** |
| **Annual Water Production (AFY)** | 484 | 605 | 363 | 847 |
| **Design Capacity (gpm)** | 400 | 500 | 300 | 700 |

b. GSWC determined the above annual water production estimates by assuming the replacement well will have the same design capacity of the existing well. In addition, GSWC assumes a 75% well utilization when estimating the annual water production in the cost benefit analysis.

c. Attachments P05 and SD03 are for the wells requested in the current GRC. The new wells will be 'La Jolla Well No. 3' and 'Baseline Well No. 6'.
d. Attachment SD04 is for the Columbia well requested in the current GRC. The new well will be 'Columbia Well No. 9'.

**Question 4:**
Please complete the following table by providing the historical water production in acre-feet per year (AFY) for the following wells during the years 2015 to 2019.

| | Annual Water Production (in AFY) | | | | |
|---|---|---|---|---|---|
| **Well** | **2015** | **2016** | **2017** | **2018** | **2019** |
| Bradford No. 3 | | | | | |
| Baseline No. 3 | | | | | |
| Columbia No. 4 | | | | | |
| Saxon No. 3 | | | | | |

**Response 4:**
The completed table is listed below.

| Annual Water Production (in AFY) | | | | | |
|---|---|---|---|---|---|
| **Well** | **2015** | **2016** | **2017** | **2018** | **2019** |
| Bradford No. 3 | 271 | 325 | 253 | 326 | 246 |
| Baseline No. 3 | 185 | 228 | 368 | 251 | 1 |
| Columbia No. 4 | 277 | 278 | 51 | 0 | 0 |
| Saxon No. 3 | 185 | 153 | 211 | 156 | 7 |

**Question 5:**
Please provide supporting documentation for the values given in response to 4. above.

**Response 5:**
The response to question 4 is based on measurements from production meters at GSWC's well sites.

If you have any questions, please do not hesitate to call me at (909) 394-3600, Extension 680.

Sincerely yours,

*/s/ Jon Pierotti*

*For* Keith Switzer
Vice President – Regulatory Affairs

c: Eileen Odell, Project Lead
Victor Chan, Project Coordinator
Shanna Foley, Attorney for Public Advocates Office
Joseph Karp, Attorney for GSWC
Chris Kolosov, Attorney for GSWC
Jenny Darney-Lane, Manager of Regulatory Affairs
Jon Pierotti, Manager of Regulatory Affairs

**ATTACHMENT 6-2: GSWC RESPONSE TO PUBLIC ADVOCATES DATA REQUEST AA9-005, ATTACHMENT AA9-005 Q.6B**

AWWA MANUAL M42

Chapter 5

# Selecting and Sizing Water-Storage Tanks

The selection and sizing of a water-storage tank involve a number of engineering considerations and generally require a detailed analysis of water demands, supply sources, and the distribution system. The purpose of this chapter is to discuss these design parameters and factors to consider in selecting and sizing a steel tank. A detailed treatment of each factor has not been attempted.

## PEAK DEMAND

Peak demand is usually the first factor to consider when sizing a distribution system tank. Most water supply sources are best operated on a 24-hour production basis and produce a quantity of water in 24 hours that is equal to the 24-hour demand. Although clearwells offer a cushion between production and demand, clearwell capacity is usually considered production reserve rather than distribution reserve. If distribution system supply sources are operated with a relatively constant pumping rate equal to the daily demand rate, any water in excess of the hourly demand must be stored in elevated tanks (whether the elevation is natural or structural). The usual curves for demand are lowest in the early morning hours, and the tanks are filled during this period. As the day progresses, demand increases and usually peaks in late afternoon; the tanks feed back into the system during this period. A tank functioning in this manner helps maintain a relatively constant pressure in the system.

Figure 5-1 shows a typical daily demand curve. In this example, the maximum consumption rate is 200 percent of the average daily rate, and the quantity stored to achieve a level pumping rate is 20 percent of the daily consumption. This 20 percent of daily consumption is not necessarily the optimal ratio of storage to consumption, because most water regulatory agencies require more storage or emergency sources.

## FIRE FLOW

Fire flow is usually the second factor to consider when determining tank capacity. Insurance underwriters have developed formulas to determine desirable quantities, pressures, and flow duration. Using these formulas, all classes and uses of all buildings within the area served are considered. Frequently, storage requirements for fire flow are greater than the storage required for system regulation, and a large fire-flow demand may require additional pumping capacity as well as the use of stored water.

## TOP AND BOTTOM CAPACITY LEVELS

In addition to establishing the storage facility's necessary capacity, required top and bottom capacity levels must also be established. These three values, combined with aesthetic and economic considerations, greatly influence the geometry of the final tank design.

A detailed hydraulic analysis of the water distribution system for which the storage tank is being designed is usually conducted to establish the BCL and TCL elevations that will provide effective, functional storage at a given tank site. A distribution system is analyzed by creating a computer model with hydraulic data for the pipeline distribution network, distribution system pumping facilities, and various water demand conditions. This program produces hydraulic gradients across the distribution system for the particular demand condition represented (e.g., fire flow, maximum hour, maximum day, tank replenishment). The goals of this exercise are (1) to produce a coordinated design covering system pumping capacity, head conditions, and pipeline improvements necessary to provide adequate system transmission capacity to and from the tank, and (2) to establish the range of operating gradients or water levels at the tank. For further information, refer to AWWA Manual M31, *Distribution System Requirements for Fire Protection*, and AWWA Manual M32, *Computer Modeling of Water Distribution Systems*.

## WATER QUALITY ISSUES

The design phase of a new tank project is the best time to consider how a tank design and piping configuration may contribute to water quality. Water circulation and water flow should be included in the design parameters. Water age can be managed through a well-designed system that "exercises" the tank; considerations include water turnover, altitude valves, pumping management, and other components for maintaining fresh water in the tank and mitigating water quality issues. Both active and passive systems for improving water quality in tanks are available for new and existing tanks.

Water quality is a significant concern to water distribution system managers. Disinfection by-product (DBP) formation is largely dependent on reaction time, and it can continue for several days within the distribution system. At the same time, disinfectant residual must be maintained throughout the most remote components of the system to ensure pathogen-free water. Managing the residence time of water within storage tanks is one practice available to minimize water age within the distribution system. Water system managers and engineers should consider the need for circulation of water and residence time management within storage tanks during the design phase.

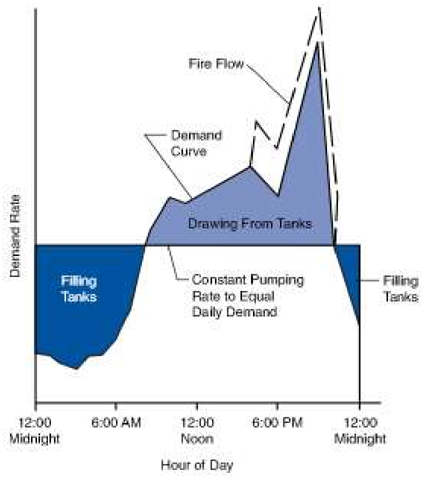



Figure 5-1 Typical daily flow at constant pumping rate

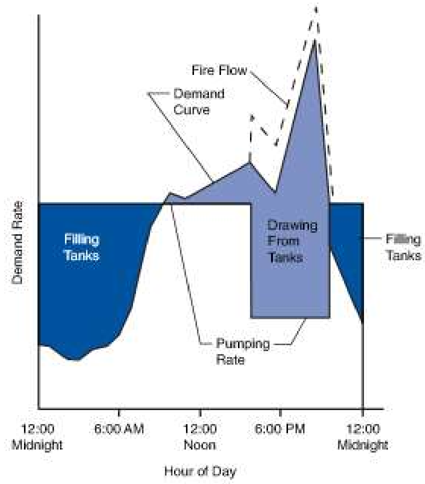



Figure 5-2 Typical daily flow with variable-rate pumping

## ENERGY COSTS

Many power utilities have adopted rates based on when electricity is used, and it may be cost-effective to control pumping in an effort to reduce the maximum power demand. Figure 5-1 shows the use of constant-rate pumping for 24 hours. However, the part-time use of more or larger pumps may be more cost-effective. To get the best electric power rates, pumping (or power-demand load) must be reduced during the periods when the maximum electrical demand occurs. A simple way to reduce rates is to pump more water into the storage tanks during hours when electrical power demand is low and to reduce pumping during periods when that demand is high (Figure 5-2). This technique requires increased storage capacity.

## FUTURE NEEDS

Future needs are an important consideration, and where practical, a tank should be sized to provide for anticipated future growth and the resulting increase in water demands. This consideration is particularly important in the design of water-storage tanks, since they represent a large capital investment, and future enlargement of their storage capacity is not always feasible. Proper sizing of a storage tank must also establish proper water turnover and circulation to ensure that water quality standards are met.

## ENVIRONMENTAL IMPACT

The major environmental impact of the tank itself is its appearance. This impact can be mitigated by the use of tank designs and exterior coating systems that blend into the surrounding terrain. Site location and site development (discussed in detail in chapter 6) are also important factors to consider in reducing any adverse environmental impacts.

The increased availability of water for use by customers made possible by greater storage may also be an environmental concern, but this consideration relates to the broader topics of land-use planning and wastewater discharge capacity, which should be evaluated before the need for additional storage is addressed.

## TANK COSTS

Tank costs vary with type, capacity, and site. These factors are interrelated and are discussed in the following paragraphs.

### Variation With Type

The prime influence on cost is the configuration of the tank—i.e., whether a standpipe, reservoir, or elevated tank. Figure 5-3 illustrates the relative differences in the cost per unit volume for the three tank configurations. It is apparent that if an accessible high-elevation site is available, a reservoir-type tank will be the most economical.

The cost of a standpipe depends on its ratio of height to diameter. A tall, small-diameter standpipe will cost more than one of the same capacity having a diameter only slightly greater than its height. Two elements influence this cost differential. First, the minimum weight of steel to contain a given capacity is usually found in tanks that have a diameter equal to their height. Second, taller tanks cost more per unit weight of steel to erect because of the difficulties in lifting the steel and conducting assembly operations at greater heights.

When the cost per unit volume of a standpipe is computed, only part of the total storage may be considered effective storage. The designer should determine the head range within which the water is useful and compute from this the amount of effective water storage. The comparison of standpipe costs should then be based on cost per unit volume of effective storage.

### Variation With Capacity

With elevated tanks, the cost per unit volume decreases significantly as the tank capacity is increased. A 100,000-gal (380,000-L) elevated tank has approximately twice the cost per unit volume of a 500,000-gal (1.9-ML) elevated tank (Figure 5-4). For reservoirs and standpipes, an increase in capacity also lowers the cost per unit volume, but the unit cost levels out at a capacity of approximately 5 mil gal (19 ML).

### Variation With Site

The importance of a well-conceived site location cannot be overemphasized. Access costs, construction costs, foundation costs, and insurance costs can all be minimized if the site selection guidelines set forth in chapter 6 are followed.

### Cost Estimates

As improvements are made in methods of design and construction, and as competitive market forces change, the pricing guidelines will change. This will affect the accuracy of Figures 5-3 and 5-4. Current estimates of construction costs should be obtained from tank contractors before a tank size, configuration, or style is selected.

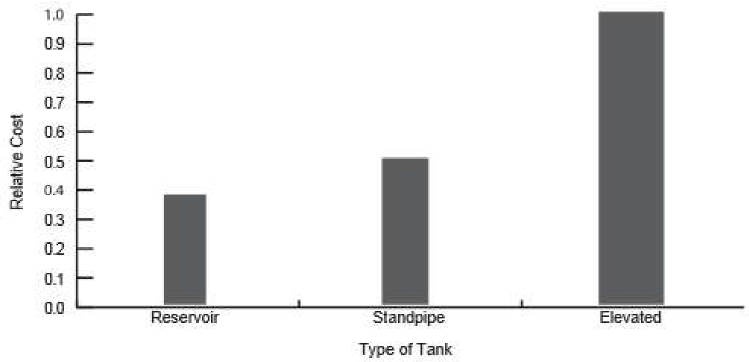
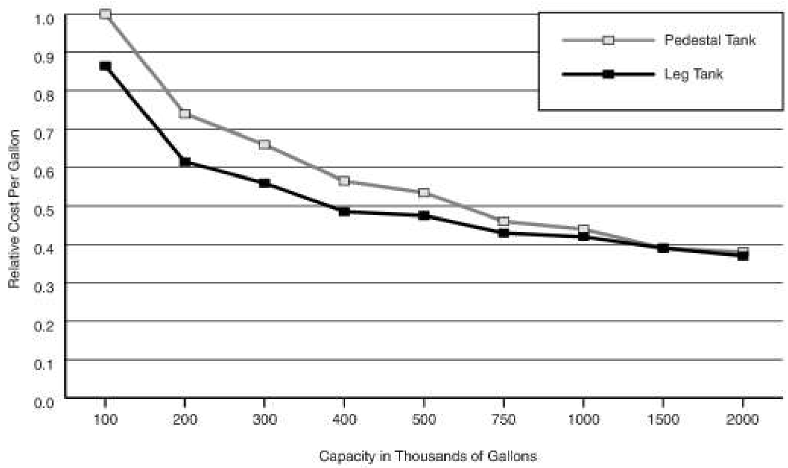



Figure 5-3 Relative cost by type of steel tank for 500,000-gal (1.9-ML) tanks




NOTE: Horizontal axis not to scale.

Figure 5-4 Relative cost by type of elevated steel tank

**ATTACHMENT 6-3: GSWC RESPONSE TO PUBLIC ADVOCATES DATA REQUEST AA9-010**

Golden State
Water Company
A Subsidiary of American States Water Company

October 15, 2020

Anthony Andrade, Public Advocates Office
**CALIFORNIA PUBLIC UTILITIES COMMISSION**
505 Van Ness Avenue
San Francisco, CA 94102

Subject: Data Request AA9-010 (A.20-07-012) Saxon and Jeffries Plants Response
Due Date: October 15, 2020

Dear Anthony Andrade,

In response to the above referenced data request number, we are pleased to submit the following responses:

The following data requests are a follow up to the 10/2/2020 meeting between the Public Advocates Office and GSWC.

**Question 1:**
In "Hanford and Insco Operating District Capital Testimony," page 245, GSWC states that it should replace the Saxon Plant's Motor Control Center (MCC) and Programmable Logic Controller (PLC). The electrical assesment in the Capital Testimony Attachment SGV01 states that the MCC has interior and exterior rust issues and missing hardware, and that the electrical equipment is out-of-date, has corrosion, and has "live parts dangerously close to deadfronts."

a. What year did GSWC conduct the assessment in the Attachment SGV01?
b. Since GSWC conducted the assessment, has GSWC corrected the MCC and electrical equipment issues identified by the assessment?
c. Please provide current photographs showing the MCC interior and exterior rust issues and missing hardware.
d. Please provide current photographs showing the electrical equipment's corrosion and "live parts dangerously close to deadfronts."

**Response 1:**

a. 2019.

b. Exterior missing hardware on MCC has been addressed.

c. Please see the attached file "Q1.c Saxon MCC Photos Rust.pdf".

d. Please see the attached file "Q1.d Saxon MCC Photo Deadfronts-Door, Heat Cracks, Bare Wires.pdf".

**Question 2:**

In "Hanford and Insco Operating District Capital Testimony," page 248, GSWC describes its plan to demolish the existing Saxon Field Office and build a replacement at the Encinita Plant. On page 251, lines 17-19, GSWC states that: "the existing building is of modular construction, has HVACUUM issues, does not meet current ADA requirements, and has electrical equipment that has exceeded its useful life."

a. When was the existing Saxon Field Office built?

b. How many hours each day is the Saxon Field Office occupied?

c. How many employees occupy the Saxon Field Office each day?

d. Is GSWC concerned that the Saxon Field Office is of modular construction?

e. What are the HVACUUM issues?

f. What are the unmet American Disability Act (ADA) requirements?

g. Can the ADA requirements only be met by constructing a new building?

h. What electrical equipment has exceeded its useful life?

i. Why is the electrical equipment that has exceeded its useful life in the current building a justification for a new building?

**Response 2:**

a. The exact date is not known, but we were able to determine the Saxon Field Office was built sometime between 1969 and 1982.

b. The Saxon Field Office is occupied for approximately 3 hours each day.

c. Eight employees occupy the Saxon Field Office each day.

d. No

e. It's an uninsulated metal building with two window HVAC units. The lack of insulation allows the cooler air from the HVAC unit to escape in the summer and the warmer air to escape in the winter.

f. The doorways and accessories (i.e. closer, knobs) are not ADA compliant. Pathways and access to the restroom are not ADA compliant.

g. No.

h. The MCC panel has exceeded its useful life as it was part of the original building construction.

i. The outdated electrical equipment is not the reason a new building is being proposed. The existing building will be demolished to make room for a new booster pump station, well, electrical equipment and reservoir.

**Question 3:**
In "Hanford and Insco Operating District Capital Testimony," page 249, lines 23-24, GSWC states that it plans to remove and replace the Jeffries Plant's chemical building.

a. Why does GSWC plan to replace the existing chemical building?

b. Please provide current photographs of the chemical building that show the need for replacement.

**Response 3**

a. The existing chemical building was constructed in 1988. GSWC has determined that the chemical building is in poor condition and needs to be replaced.

b. Please see attached file "Q3.b Jeffries Plant Chemical Building Photos.pdf".

If you have any questions, please do not hesitate to call me at (909) 394-3600, Extension 680.

Sincerely yours,

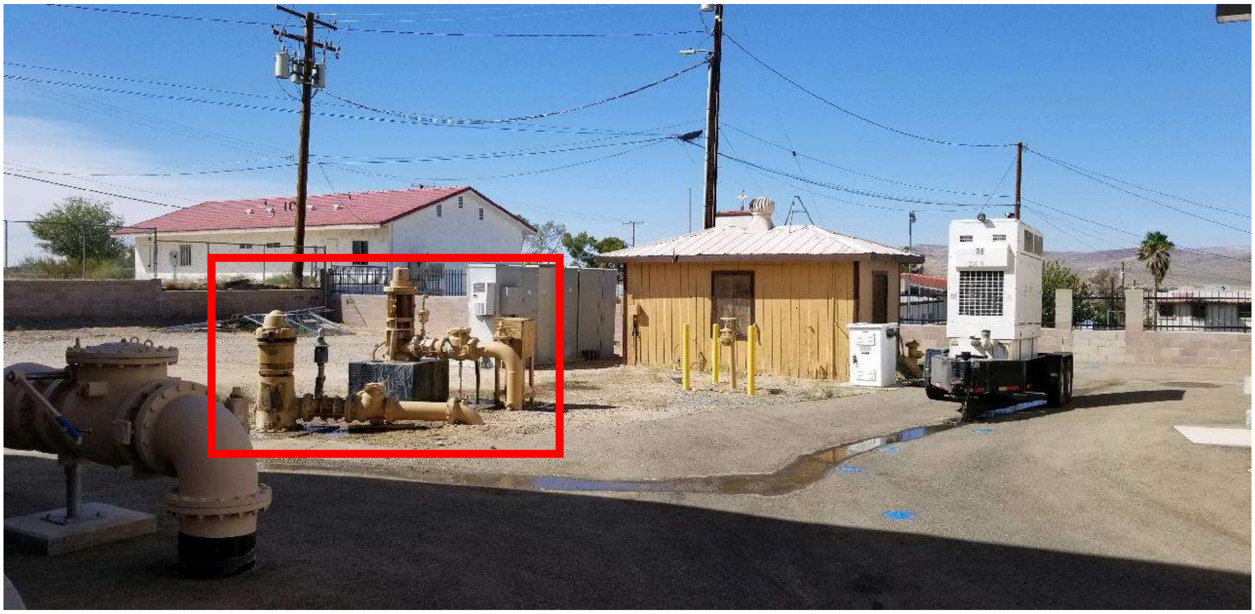
Jon Pierotti

Digitally signed by Jon Pierotti
DN: cn=Jon Pierotti, o=GSWC, ou=Regulatory Affairs, email=jon.pierotti@gswater.com, c=US
Date: 2020.10.15 08:02:12 -07'00'

For Keith Switzer
Vice President – Regulatory Affairs

c: Eileen Odell, Project Lead
Victor Chan, Project Coordinator
Shanna Foley, Attorney for Public Advocates Office
Joseph Karp, Attorney for GSWC
Chris Kolosov, Attorney for GSWC
Jenny Darney-Lane, Manager of Regulatory Affairs
Jon Pierotti, Manager of Regulatory Affairs

# ATTACHMENT 7-1: GSWC BEAR VALLEY SITE PHOTOGRAPHS



**ATTACHMENT 7-2: GSWC RESPONSE TO PUBLIC ADVOCATES DATA REQUEST AA9-013**

Golden State
Water Company
A Subsidiary of American States Water Company

October 16, 2020

Anthony Andrade, Public Advocates Office
**CALIFORNIA PUBLIC UTILITIES COMMISSION**
505 Van Ness Avenue
San Francisco, CA 94102

Subject: Data Request AA9-012 (A.20-07-012)
Region 3 Booster Stations III Response
Due Date: October 16, 2020

Dear Anthony Andrade,

In response to the above referenced data request number, we are pleased to submit the following responses:

**Question 1:**
In "Hanford and Insco Operating District Capital Testimony," pages 264-265, GSWC states that it plans to construct a new booster pump station (BPS) at the Bear Valley Plant. GSWC's plan includes constructing a new BPS building and replacing four booster pumps.

a. The site photos "Bear Valley Booster Station Replacement" 1-3, 5, and 6 provided by GSWC on 9/30/2020 show an existing BPS building. Why does GSWC plan to replace the existing BPS building?
b. Can GSWC replace the existing BPS building with a new wooden building?
c. Please provide the ages of the four Bear Valley Plant boosters.
d. Please provide original documents showing the most recent pump test data for the four Bear Valley Plant boosters.
e. Have the four Bear Valley Plant boosters failed? If yes, please provide the repair record for each failure.

**Response 1:**

a. The existing BPS building is 10' x 18' with a permanent or non-removable roof structure. The proposed boosters will be vertical turbine pumps and, as such, will require an access hatch in the roof of the pump building for each booster to allow boom trucks or mobile cranes access to remove, replace, and maintain them. The roof structure of the existing booster building is structurally integrated into the building and would have to be dismantled and removed to provide necessary clearance to access the pumping equipment.

b. Yes
c. The exact age of Booster A is unknown but we estimate it to be prior to 1951. Booster B was installed in 1951. Booster C was installed in 1960. The Booster D Motor was installed in 1987 and the most recent D Pump was installed in 1992.
d. See Attached “Q1.d Booster Pump 2019 Tests.pdf”.
e. No

**Question 2:**
In “PCE_RIII – Barstow (Bear Valley Phase 3).xlsx,” tab “Construction Cost,” row 17, GSWC includes a $600,000 estimate for a BPS block building and ventilation. The estimate is calculated with a 2019 unit cost of $500 per square foot (SF).

a. How did GSWC determine that it should use a $500 per SF unit cost for the new Bear Valley BPS building? Provide any source documents used in the formulation of this estimate.
b. How did GSWC determine that the new Bear Valley BPS building should have an area of 1,200 SF?

**Response 2:**

a. A company-wide building cost comparison was performed and GSWC used a conservative cost estimate when estimating the cost of the new booster building. Please see attached “Q2.a Building Cost Comparison.pdf”
b. Currently only Boosters A & B are enclosed in a booster building. The footprint of the existing booster building and electrical components is approximately 600 square feet. GSWC increased this area to provide sufficient space for all four boosters and MCC and PLC panels.

If you have any questions, please do not hesitate to call me at (909) 394-3600, Extension 680.

Sincerely yours,

Jon Pierotti

Digitally signed by Jon Pierotti
DN: cn=Jon Pierotti, o=GSWC, ou=Regulatory Affairs, email=jon.pierotti@gswater.com, c=US
Date: 2020.10.16 11:48:59 -07'00'

For Keith Switzer
Vice President – Regulatory Affairs

c: Eileen Odell, Project Lead
Victor Chan, Project Coordinator
Shanna Foley, Attorney for Public Advocates Office
Joseph Karp, Attorney for GSWC
Chris Kolosov, Attorney for GSWC
Jenny Darney-Lane, Manager of Regulatory Affairs
Jon Pierotti, Manager of Regulatory Affairs

**ATTACHMENT 7-3: GSWC RESPONSE TO PUBLIC ADVOCATES DATA REQUEST JMI-009**

Golden State
Water Company
A Subsidiary of American States Water Company

October 6, 2020

Justin Menda, Public Advocates Office
**CALIFORNIA PUBLIC UTILITIES COMMISSION**
505 Van Ness Avenue
San Francisco, CA 94102

Subject: Data Request JMI-009 (A.20-07-012)
New SCADA LO SM Response
Due Date: October 1, 2020; Extension Due Date: October 6, 2020

Dear Justin Menda,

In response to the above referenced data request number, we are pleased to submit the following responses:

**Question 1:**
In response to question 1(b) of data request A2007012 JMI-004 regarding SCADA projects in the Santa Maria customer service area, GSWC described how it calculated the "New SCADA" line item. GSWC states that the costs reflects the individual option upgrade costs associated with six Santa Maria sites, costs of additonal SCADA Galaxy licenses, and software upgrades not already included in the individual option cost upgrades. The "PCE_R1 – Santa Maria (Systemwide SCADA) " workpaper shows the costs estimate for the proposed project. The "Construction Cost" tab shows the "New SCADA" line item is $599,350. The "New SCADA" line item is described to include: 1) additonal software and galaxy; 2) SCADA upgrade costs; 3) cyber security assessment; and 4) construction costs.

a. Please provide the dollar amount of the total $599,350 that is related to additional software and galaxy.

b. Please provide the dollar amount of the total $599,350 that is related to cyber security assessment.

c. Please provide the dollar amount of the total $599,350 that is related to construction costs.

**Response 1:**

1.a GSWC noticed a discrepancy between the SCADA upgrade costs presented in Patrick Kubiak's Testimony, the Prepared Testimony of Robert Hanford and Mark Insco ("Hanford-Insco Testimony"), and the following PCEs:

- PCE_RIII - Region III SCADA (2023)
- PCE_RIII - Region III SCADA (2022)
- PCE_RIII - Region III SCADA (2021)
- PCE_RI - Los Osos (Systemwide SCADA)
- PCE_RI - Santa Maria (Systemwide SCADA)
- PCE_RI - Simi Valley (Systemwide SCADA)
- PCE_RI - Clearlake (Systemwide SCADA)
- PCE_RI - Bay Point (Systemwide SCADA)
- PCE_RI - Arden-Cordova (Systemwide SCADA)

The wrong set of data was used when finalizing the Hanford-Insco Testimony and the associated PCEs.

Revised SCADA Upgrade costs to be considered for GSWC's 2020 General Rate Case Application are presented in the tables below and the attached revised PCEs included in the folder "SCADA PCEs." Updates to the proposed capital budget costs in GSWC's RO model based upon the revised PCEs can be made in columns M and O of the "Project List – DO NOT SORT" tab within RO model workpaper "SEC-51_RB_FDR Capital Budget" for the related SCADA capital projects.

A description of the methodology used to determine the SCADA Upgrade costs is provided on pages 65-69 of Patrick Kubiak's Testimony. However, please note that "Step 7: Add construction costs" as described on page 68 of Patrick Kubiak's Testimony does not apply anymore. Instead, construction costs are included in the Company Direct Costs as described in the PCE spreadsheets. Additionally, a five (5) percent contingency that had been added to the SCADA Upgrade Option costs and the PSPS integration costs has now been excluded from the revised numbers presented in this response as contingency is applied to the total project costs consistent with all capital projects proposed in this GRC.

The costs for the additional software and Galaxy, cybersecurity assessment, and construction were calculated at the District level. The tables below depict these costs for all three Districts.

## Coastal District SCADA Upgrade Costs

| Sites | Equipment To Be Upgraded | | | | | | |
|---|---|---|---|---|---|---|---|
| | PLC | Telemetry | Network | HMI | OIT | Option | Cost |
| **Santa Maria** | | | | | | | |
| Crescent | x | x | | | x | Option 4 | $59,920.00 |
| Woodmere #1 | x | x | | | x | Option 4 | $59,920.00 |
| Woodmere #2 | x | x | | | x | Option 4 | $59,920.00 |
| Kenneth | x | x | | | x | Option 4 | $59,920.00 |
| Mira Flores #2 | x | x | | | x | Option 4 | $59,920.00 |
| Oak | x | x | | | x | Option 4 | $59,920.00 |
| **Simi Valley** | | | | | | | |
| Simi Valley CSA Office | | | | x | | Option 6 | $128,400.00 |
| Alamo Reservoir | x | x | | | x | Option 4 | $59,920.00 |
| Aspen | x | x | | | x | Option 4 | $59,920.00 |
| Fitzgerald Plant | x | x | | | x | Option 4 | $59,920.00 |
| Lautenschlager Reservoir | x | x | | | x | Option 4 | $59,920.00 |
| Tapo Reservoir | x | x | | | x | Option 4 | $59,920.00 |
| **Los Osos** | | | | | | | |
| Country Club Reservoir | x | x | | | x | Option 4 | $59,920.00 |
| Country Club Filter Plant | x | x | | | x | Option 4 | $59,920.00 |
| Edna Boosters | x | x | | | x | Option 4 | $59,920.00 |
| Lewis Lane | x | x | | | x | Option 4 | $59,920.00 |
| Cabrillo | x | x | | | x | Option 4 | $59,920.00 |
| Alamo Reservoir | x | x | | | x | Option 4 | $59,920.00 |
| | | | | | | | |
| Total Coastal Individual Site Costs | | | | | | | $1,147,040 |
| Total Additional Software and Galaxy | | | | | | | $790,000 |
| Cybersecurity Assessment | | | | | | | $33,333 |

## Northern District SCADA Upgrade Costs

| Sites | Equipment To Be Upgraded | | | | | | |
|---|---|---|---|---|---|---|---|
| | PLC | Telemetry | Network | HMI | OIT | Option | Cost |
| **Rancho Cordova** | | | | | | | |
| Park Well 17 | x | x | | | x | Option 4 | $59,920 |
| Paseo Well 24 | x | x | | | x | Option 4 | $59,920 |
| South Bridge St Well 22&22B | x | x | | | x | Option 4 | $59,920 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Coloma PRV | x | x | | | x | Option 4 | $59,920 |
| Folsom PRV | x | x | | | x | Option 4 | $59,920 |
| Oselot | x | x | | | x | Option 4 | $59,920 |
| Trade Center PRV | x | x | | | x | Option 4 | $59,920 |
| **Clear Lake** | | | | | | | |
| Lake Shore Booster (Intake) | x | x | | | x | Option 4 | $59,920 |
| Oak Crest Tank And Booster | x | x | | | x | Option 4 | $59,920 |
| Sampson Reservoir | x | x | | | x | Option 4 | $59,920 |
| San Joaquin Booster | x | x | | | x | Option 4 | $59,920 |
| Sonoma Treatment Plant | | x | | x | | Option 6 | $128,400 |
| Manchester Intertie | x | x | | | x | Option 4 | $59,920 |
| Chart Recorder | x | x | | | x | Option 4 | $59,920 |
| **Baypoint** | | | | | | | |
| Chadwick | x | x | | | x | Option 4 | $59,920 |
| Evora | x | x | | | x | Option 4 | $59,920 |
| Hill St. Reservoir | x | | x | | x | Option 4 | $59,920 |
| Hill St. Treatment Plant | x | x | | x | | Option 6 | $128,400 |
| Madison | x | x | | | x | Option 4 | $59,920 |
| Pacifica | x | x | | | x | Option 4 | $59,920 |
| Skyline | x | x | | | x | Option 4 | $59,920 |
| | | | | | | | |
| Total Coastal Individual Site Costs | | | | | | | $1,395,280 |
| Total Additional Software and Galaxy | | | | | | | $470,000 |
| Cybersecurity Assessment | | | | | | | $33,333 |

## Mountain Desert District SCADA Upgrade Costs

| Sites | Equipment To be Upgraded | | | | | | |
|---|---|---|---|---|---|---|---|
| | PLC | Telemetry | Network | HMI | OIT | Option | Cost |
| **Apple Valley** | | | | | | | |
| Apple Valley Office | | x | | x | | Option 6 | $128,400 |
| Central | x | x | | | x | Option 4 | $59,920 |
| Papago | x | x | | | x | Option 4 | $59,920 |
| Valley Crest | x | x | | | x | Option 4 | $59,920 |
| Bear Valley | x | x | | | x | Option 4 | $59,920 |
| Mohawk | x | x | | | x | Option 4 | $59,920 |
| Kiowa | x | x | | | x | Option 4 | $59,920 |
| Desert View | x | x | | | x | Option 4 | $59,920 |
| Emerald | x | x | | | x | Option 4 | $59,920 |
| Lucerne | x | x | | | x | Option 4 | $59,920 |
| Sutter | x | x | | | x | Option 4 | $59,920 |
| Topaz | x | x | | | x | Option 4 | $59,920 |
| **Barstow** | | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Barstow Office | | x | | x | | Option 6 | $128,400 |
| Agarita | x | x | | | x | Option 4 | $59,920 |
| Arrowhead | x | x | | | x | Option 4 | $59,920 |
| Bear Valley | x | x | | | x | Option 4 | $59,920 |
| Bradshaw 1 | x | x | | | x | Option 4 | $59,920 |
| Bradshaw 2 | x | x | | | x | Option 4 | $59,920 |
| Buena Vista | x | x | | | x | Option 4 | $59,920 |
| College | x | x | | | x | Option 4 | $59,920 |
| Crooks | x | x | | | x | Option 4 | $59,920 |
| Eaton | x | x | | | x | Option 4 | $59,920 |
| Flora | x | x | | | x | Option 4 | $59,920 |
| Glen Road Well 1 | x | x | | | x | Option 4 | $59,920 |
| Glen Road Well 2 | x | x | | | x | Option 4 | $59,920 |
| Jasper | x | x | | | x | Option 4 | $59,920 |
| Main | x | x | | | x | Option 4 | $59,920 |
| Mojave | x | x | | | x | Option 4 | $59,920 |
| Phillips | x | x | | | x | Option 4 | $59,920 |
| Riverside | x | x | | | x | Option 4 | $59,920 |
| Soapmine | x | x | | | x | Option 4 | $59,920 |
| **Calipatria** | | | | | | | |
| Blair Rd. Boosters | x | x | | | x | Option 4 | $59,920 |
| Niland | x | x | | | x | Option 4 | $59,920 |
| **Morongo** | | | | | | | |
| Morongo Office | | | x | x | | Option 6 | $128,400 |
| Bella Vista | x | x | | | x | Option 4 | $59,920 |
| Mojave | x | x | | | x | Option 4 | $59,920 |
| Vale | x | x | | | x | Option 4 | $59,920 |
| Yeager | x | x | | | x | Option 4 | $59,920 |
| **Wrightwood** | | | | | | | |
| Wrightwood Office | | x | | x | | Option 6 | $128,400 |
| Bobolink | x | x | | | x | Option 4 | $59,920 |
| Buford | x | x | | | x | Option 4 | $59,920 |
| Cardinal | x | x | | | x | Option 4 | $59,920 |
| Finch | x | x | | | x | Option 4 | $59,920 |
| Government Canyon S. Res. | x | x | | | x | Option 4 | $59,920 |
| Government Canyon Well | x | x | | | x | Option 4 | $59,920 |
| Heath | x | x | | | x | Option 4 | $59,920 |
| | | | | | | | |
| Total Coastal Individual Site Costs | | | | | | | $3,030,240 |
| Total Additional Software and Galaxy | | | | | | | $1,220,000 |
| PSPS SCADA Integration Costs | | | | | | | $80,000 |
| Cybersecurity Assessment | | | | | | | $33,333 |
| Calipatria Treatment Plant Upgrade | | | | | | | $1,300,000 |

1.b Please see answer to question 1.a. above.

1.c Please see answer to question 1.a. above.

**Question 2:**
In response to question 2(c) of data request A2007012 JMI-004 regarding SCADA projects in the Los Osos customer service area, GSWC described how it calculated the "New SCADA" line item. GSWC states that the costs reflect the individual option upgrade costs associated with six Los Osos sites, the costs of additonal SCADA Galaxy licenses, and software upgrades not already included in the individual option cost upgrades. The "PCE_R1 – Los Osos (Systemwide SCADA) " workpaper shows the costs estimate for the proposed project. The "Construction Cost" tab shows the "New SCADA" line item is $599,350. The "New SCADA" line item is described to include: 1) additonal software and galaxy; 2) SCADA upgrade costs; 3) cyber security assessment; and 4) construction costs.

a. Please provide the dollar amount of the total $599,350 that is related to additional software and galaxy.

b. Please provide the dollar amount of the total $599,350 that is related to cyber security assessment.

c. Please provide the dollar amount of the total $599,350 that is related to construction costs.

**Response 2:**

2.a Please see answer to question 1.a. above.

2.b Please see answer to question 1.a. above.

2.c Please see answer to question 1.a. above.

If you have any questions, please do not hesitate to call me at (909) 394-3600, Extension 680.

Sincerely yours,

Jon Pierotti Digitally signed by Jon Pierotti
DN: cn=Jon Pierotti, o=GSWC, ou=Regulatory Affairs, email=jon.pierotti@gswater.com, c=US
Date: 2020.10.06 15:34:28 -07'00'

For Keith Switzer
Vice President – Regulatory Affairs

c: Eileen Odell, Project Lead
Shanna Foley, Attorney for Public Advocates Office
Joseph Karp, Attorney for GSWC
Chris Kolosov, Attorney for GSWC
Jenny Darney-Lane, Manager of Regulatory Affairs
Jon Pierotti, Manager of Regulatory Affairs

## Project Cost Estimate

| | |
|---|---|
| **Project Title** | Regionwide SCADA (2021) |
| | Replace existing system with GSWC-standard system |
| **Budget Year** | **(All estimates are calculated in 2019 unit costs)** |
| **Region/District** | |
| **Customer Service Area** | |
| **Water Distribution System** | |

### Project Need

Region III systems are currently run with outdated Supervisory Control and Data Acquisition (SCADA) hardware and unsupported software, and not all plant sites are equipped with SCADA. To provide more reliability, run the system more efficiently, and obtain technical support, the SCADA system must be fully completed - in accordance with GSWC SCADA standards - and to the latest version of Wonderware software. For more information on the GSWC SCADA upgrade project (including detailed approach, components included, selected sites, and additional justification) please see the Prepared Testimony of Patrick Kubiak.

This project was identified as a high-priority project. The risks associated with this asset are driven by the SCADA Master Plan.

The GSWC stated mission of providing a safe and economical water supply was used as the basis for the desired level of service for all GSWC systems. An asset hierarchy was developed to provide that level of service based on health, safety and security, the financial impacts on the utility, public confidence, compliance with regulations, permits and codes, and system reliability.

### Project Description

Complete SCADA installation at the following plant sites in Region III in accordance with GSWC standards: Barstow (19), Morongo (5).

Total Project Cost (2019 dollars):

| | | |
|---|---|---|
| Direct | $ 395,280 | Design by outside consultant |
| Construction | $ 2,196,200 | Design estimate increased to account for consulting costs |
| Total | $ 2,591,480 | |
| | **Overhead, Contingency and Escalation are added to costs in 2021-2023 Project List** | |

Total Project Cost (with Overhead, Contingency and Escalation included):

| | |
|---|---|
| Direct | $ 515,100 |
| Construction | $ 2,843,200 |
| Total | $ 3,358,300 |

## Project Cost Estimate

| | |
|---|---|
| **Project Title** | Regionwide SCADA (2022) |
| | Replace existing system with GSWC-standard system |
| **Budget Year** | **(All estimates are calculated in 2019 unit costs)** |
| **Region/District** | |
| **Customer Service Area** | |
| **Water Distribution System** | |

### Project Need

Region III systems are currently run with outdated Supervisory Control and Data Acquisition (SCADA) hardware and unsupported software, and not all plant sites are equipped with SCADA. To provide more reliability, run the system more efficiently, and obtain technical support, the SCADA system must be fully completed - in accordance with GSWC SCADA standards - and to the latest version of Wonderware software. For more information on the GSWC SCADA upgrade project (including detailed approach, components included, selected sites, and additional justification) please see the Prepared Testimony of Patrick Kubiak.

This project was identified as a high-priority project. The risks associated with this asset are driven by the SCADA Master Plan.

The GSWC stated mission of providing a safe and economical water supply was used as the basis for the desired level of service for all GSWC systems. An asset hierarchy was developed to provide that level of service based on health, safety and security, the financial impacts on the utility, public confidence, compliance with regulations, permits and codes, and system reliability.

### Project Description

Complete SCADA installation at the following plant sites in Region III in accordance with GSWC standards: Apple Valley (12), Wrightwood (8).

Total Project Cost (2019 dollars):

| | | |
|---|---|---|
| Direct | $ 331,440 | Design by outside consultant |
| Construction | $ 1,841,500 | Design estimate increased to account for consulting costs |
| Total | $ 2,172,940 | |
| | **Overhead, Contingency and Escalation are added to costs in 2021-2023 Project List** | |

Total Project Cost (with Overhead, Contingency and Escalation included):

| | |
|---|---|
| Direct | $ 449,600 |
| Construction | $ 2,419,800 |
| Total | $ 2,869,400 |

## Project Cost Estimate

| | | | | | |
|---|---|---|---|---|---|
| **Project Title** | Regionwide SCADA (2023) | | | | |
| | Replace existing system with GSWC-standard system | | | | |
| **Budget Year** | **(All estimates are calculated in 2019 unit costs)** | | | | |
| **Region/District** | | | | | |
| **Customer Service Area** | | | | | |
| **Water Distribution System** | | | | | |

### Project Need

Region III systems are currently run with outdated Supervisory Control and Data Acquisition (SCADA) hardware and unsupported software, and not all plant sites are equipped with SCADA. To provide more reliability, run the system more efficiently, and obtain technical support, the SCADA system must be fully completed - in accordance with GSWC SCADA standards - and to the latest version of Wonderware software. For more information on the GSWC SCADA upgrade project (including detailed approach, components included, selected sites, and additional justification) please see the Prepared Testimony of Patrick Kubiak.

This project was identified as a high-priority project. The risks associated with this asset are driven by the SCADA Master Plan.

The GSWC stated mission of providing a safe and economical water supply was used as the basis for the desired level of service for all GSWC systems. An asset hierarchy was developed to provide that level of service based on health, safety and security, the financial impacts on the utility, public confidence, compliance with regulations, permits and codes, and system reliability.

### Project Description

Complete SCADA installation at the following plant sites in Region III in accordance with GSWC standards: Calipatria (3).

Total Project Cost (2019 dollars):

| | | |
|---|---|---|
| Direct | $ 292,680 | Design by outside consultant |
| Construction | $ 1,626,000 | Design estimate increased to account for consulting costs |
| Total | $ 1,918,680 | |

**Overhead, Contingency and Escalation are added to costs in 2021-2023 Project List**

Total Project Cost (with Overhead, Contingency and Escalation included):

| | |
|---|---|
| Direct | $ 414,100 |
| Construction | $ 2,168,700 |
| Total | $ 2,582,800 |

**ATTACHMENT 9-1: GSWC RESPONSE TO PUBLIC ADVOCATES DATA REQUEST AA9-003**

Golden State
Water Company
A Subsidiary of American States Water Company

August 31, 2020

Anthony Andrade, Public Advocates Office
**CALIFORNIA PUBLIC UTILITIES COMMISSION**
505 Van Ness Avenue
San Francisco, CA 94102

Subject: Data Request AA9-003 (A.20-07-012)
Region 3 Highway Treatment Response
Due Date: September 1, 2020

Dear Anthony Andrade,

In response to the above referenced data request number, we are pleased to submit the following responses:

**Question 1:**
In "Hanford and Insco Operating District Capital Testimony," page 285, GSWC requests a package treatment plant to remove uranium at the Morongo Del Norte system's Highway Well.

a. Has any regulatory agency, such as San Bernardino County's Division of Environmental Health Services, recommended or instructed that GSWC treat the Highway Well for uranium? If so, provide a copy of the communication or document containing that recommendation or instruction.

b. Has any regulatory agency recommended or instructed that GSWC treat the Morongo Del Norte system's Bella Vista Well for uranium? If so, provide a copy of the communication or document containing that recommendation or instruction.

**Response 1:**

a. During the recent Sanitary Survey, the level of uranium at Highway Well was discussed with the regulatory inspector and a Uranium Removal System was suggested to reduce the level of uranium below the 80% of the MCL.

b. Based on the past six-year's results, the average of uranium concentration is 16 piC/L (80% of the MCL). During the recent Sanitary Survey, the level of uranium at Bella Vista Well was discussed with the regulatory inspector and a Uranium Removal System was suggested to reduce the level of uranium below the 80% of the MCL.

**Question 2:**
GSWC's Morongo Del Norte system has two operational wells, Highway and Bella Vista, and an out-of-service well, Elm. In Application (A.) 14-07-006, GSWC requested a uranium removal system (URS) at the Elm Well. According to A.14-07-006's "Testimony Capital," page 370, line 11, GSWC planned to design, permit, and construct the URS in 2015. In D.16-12-067, the Commission authorized the URS at the Elm Well. However, in the current GRC, GSWC's Minimum Data Requirements (MDR) attachment, "D.5 Authorized.xlsx," tab "Region 3," row 103, states that the Elm Well's URS is "In progress."

a. Please explain why GSWC has not put the Elm Well's URS in service.
b. When will GSWC put the Elm Well's URS in service?
c. Given that the Morongo Del Norte system will have a URS at the Elm Well, why would the system also require a URS at the Highway Well?

**Response 2:**

a. The Elm Well needs rehabilitation including replacement of pumping equipment, because it has been out-of-service. Due to the required rehabilitation work the construction of the treatment facility has been delayed.

b. It is anticipated that the Elm Well Uranium Removal System will be placed in service in the 1st Quarter of 2021.

c. The need for the Highway Well URS project was explained in "Hanford and Insco Operating District Capital Testimony" page 285.

**Question 3:**
In MDR attachment "D.6 Built not Authorized.xlsx," tab "Region 3," row 20, GSWC states that uranium removal at Bella Vista Well is in progress. Accordingly, in Attachment C-30 Morongo Del Norte Master Plan, page 7-1, GSWC states that it "is currently installing uranium removal portable exchange system at Elm and Bella Vista wells."

a. Please explain why GSWC decided to install a URS at the Bella Vista Well.
b. Please provide the Results of Operation model location (file and tab name) where GSWC records its historical and projected spending on the Bella Vista Well's URS.

c. Please explain if there are any differences between the URS in progress at the Elm and Bella Vista wells and the requested package treatment plant at the Highway Well.

Response 3:

a. Bella Vista Well was constructed in 2007 and is one of three wells located in the Morongo Del Norte System. The well produces 100 gpm of water supply. The well water has averaged 16 piC/L uranium concentration for the past six years. The uranium concentration is trending up and is currently at 17 piC/L, just below the MCL of 20 piC/L. When the well reaches the MCL, it will be shut off and taken out of service. The installation of a Uranium Removal System is recommended at the Bella Vista Well.

b. The projected operational cost for the uranium treatment system is $29,754 per annum. Actual cost will vary once it is placed in service due to inflation and other surcharges that might be incurred in the event that the uranium concentration or pumping conditions change. There is no historical data on the operational cost for the uranium treatment system, because it hasn't been placed in-service.

c. There is no major difference between Uranium Removal System at Elm and Bella Vista Wells and requested treatment plant at Highway Well. The only difference could be the number of Ion Exchange vessels. The number of treatment vessels is depended on the well capacity and the Uranium levels in the raw water to be treated.

**Question 4:**
GSWC provided uranium lab results for the Highway Well in Attachment MV01.

a. The Attachment MV01 lab results use the "MN-HI-W01" site ID for all results except the last two which have the "MN-HI-W02" and "MN-HI-W03" site IDs. Please explain the difference between the three site IDs.
b. Please provide the uranium lab results for the Bella Vista Well from 2004 to 2019.

**Response 4:**

a. The MN-HI-W02 and MN-HI-W03 are typo. Revised "MV01 – Highway Well Ur Lab Results" is attached.

b. See attachment - “MV02 – Bella Vista Well Ur Lab Results_2004-2009”.

If you have any questions, please do not hesitate to call me at (909) 394-3600, Extension 680.

Sincerely yours,

Jon Pierotti

Digitally signed by Jon Pierotti
DN: cn=Jon Pierotti, o=GSWC, ou=Regulatory Affairs, email=jon.pierotti@gswater.com, c=US
Date: 2020.08.31 15:31:28 -07'00'

For Keith Switzer
Vice President – Regulatory Affairs

c: Eileen Odell, Project Lead
Victor Chan, Project Coordinator
Shanna Foley, Attorney for Public Advocates Office
Joseph Karp, Attorney for GSWC
Chris Kolosov, Attorney for GSWC
Jenny Darney-Lane, Manager of Regulatory Affairs
Jon Pierotti, Manager of Regulatory Affairs

**ATTACHMENT 9-2: GSWC RESPONSE TO PUBLIC ADVOCATES DATA REQUEST AA9-003, ATTACHMENT AA9-003 Q.4A**

| Sample Date | Site ID | sitelabel | Analyte | Result ug/L | Result pCi/L |
|---|---|---|---|---|---|
| 1/5/2004 12:00:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 21 | 14.40 |
| 4/6/2004 12:00:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 20 | 13.60 |
| 7/6/2004 12:00:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 14 | 9.73 |
| 10/5/2004 12:00:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 23 | 15.90 |
| 11/14/2006 8:30:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 31 | 21.48 |
| 2/13/2007 8:30:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 23 | 15.94 |
| 5/15/2007 9:00:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 24 | 16.63 |
| 8/7/2007 8:30:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 23 | 15.94 |
| 11/6/2007 8:30:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 23 | 15.94 |
| 5/13/2008 8:35:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 24 | 16.63 |
| 8/12/2008 8:30:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 22 | 15.25 |
| 11/4/2008 8:30:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 20 | 13.86 |
| 2/3/2009 8:30:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 20 | 13.86 |
| 5/5/2009 8:30:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 24 | 16.63 |
| 8/4/2009 8:35:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 22 | 15.25 |
| 11/3/2009 8:30:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 19 | 13.17 |
| 2/1/2010 8:35:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 23 | 15.94 |
| 5/4/2010 8:30:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 22 | 15.25 |
| 8/3/2010 9:41:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 37 | 25.64 |
| 11/9/2010 8:25:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 23 | 15.94 |
| 1/25/2011 8:30:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 25 | 17.33 |
| 5/3/2011 11:05:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 24 | 16.63 |
| 8/2/2011 8:45:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 24 | 16.63 |
| 11/1/2011 11:05:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 24 | 16.63 |
| 9/25/2012 10:25:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 16 | 11.09 |
| 11/6/2012 8:40:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 20 | 13.86 |
| 2/5/2013 10:00:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 20 | 13.86 |
| 5/7/2013 9:20:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 19 | 13.17 |
| 8/6/2013 7:55:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 17 | 11.78 |
| 11/5/2013 9:00:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 20 | 13.86 |
| 2/11/2014 9:40:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 20 | 13.86 |
| 2/18/2014 8:45:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 20 | 13.86 |
| 5/6/2014 9:05:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 22 | 15.25 |
| 8/5/2014 9:30:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 21 | 14.55 |
| 11/18/2014 7:45:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 19 | 13.17 |
| 2/10/2015 10:14:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 20 | 13.86 |
| 5/26/2015 9:48:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 19 | 13.17 |
| 8/11/2015 10:00:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 19 | 13.17 |
| 11/10/2015 9:35:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 20 | 13.86 |
| 2/14/2017 9:37:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 26 | 18.02 |
| 8/1/2017 12:37:00 PM | MN-HI-W01 | Highway Well | Uranium (total) | 23 | 15.94 |
| 11/14/2017 8:53:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 24 | 16.63 |
| 2/6/2018 11:42:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 26 | 18.02 |
| 5/8/2018 10:25:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 23 | 15.94 |

| | | | | | |
|---|---|---|---|---|---|
| 8/7/2018 10:26:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 25 | 17.33 |
| 11/6/2018 10:49:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 22 | 15.25 |
| 2/5/2019 9:57:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 22 | 15.25 |
| 5/14/2019 11:16:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 23 | 15.94 |
| 8/6/2019 12:00:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 25 | 17.33 |
| 11/5/2019 12:00:00 AM | MN-HI-W01 | Highway Well | Uranium (total) | 23 | 15.94 |